ORGANIZATIONAL AND BUREAUCRATIC POLITICS

IN SOVIET DEFENSE DECISIONMAKING:

A CASE STUDY OF THE SOVIET AIR DEFENSE FORCES

by

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ABSTRACT

How do the different organizations in the Soviet defense decisionmaking apparatus interact and influence each other in the decisionmaking process? What role do bureaucratic and organizational politics play in the decisionmaking process and how do they influence Soviet defense policy as a whole? This dissertation addresses these questions through a case study of the Soviet air defense forces (the Troops of the Air Defense--VPVO) using a multi-level model of the Soviet defense decisionmaking structure and process. In this model the General Staff is assumed to act as a unitary strategic actor, while the military services behave as organizational and bureaucratic actors, attempting to influence the adoption of policy, and mediating its implementation.

This case study examines the evolution of the Soviet air defense forces from their formation as a service in 1948 to the present. Particular attention was paid to the interaction of the VPVO with the General Staff during several periods of doctrinal and strategic change. It was found that while in several instances the VPVO was able to influence policy through biased representations of its capabilities and advocacy of its interests, these attempts were generally unsuccessful. In most instances the General Staff and VPVO either had shared interests or the General Staff was able to override VPVO objections to a proposed policy change. Only in one instance was persistent advocacy of the VPVO able to reverse a policy decision by the General Staff. Thus, the study indicates that while Soviet military services do attempt to influence policy by advocacy of their interests, these attempts are not usually successful due to the predominance of the General Staff in the Soviet defense decisionmaking structure.

Despite the lack of success of its advocacy the VPVO was found to exhibit many of the characteristics expected of a bureaucratic organization: in-

cremental decisionmaking, conservatism, suboptimal learning behavior, and some inter-branch conflict. Substantial evidence also indicates that problems of inter-service coordination have proven difficult to resolve and that significant inter-service rivalry and conflict took place during World War II and may still occur today.

This dissertation therefore indicates that there are limits on the applicability of organizational and bureaucratic politics models of Soviet defense decisionmaking as they do not incorporate the unique contributions of the General Staff. Nevertheless, organization theory does provide a good model of the internal behavior of the VPVO has a distorting influence on the implementation of strategy and operational art. The model of Soviet defense decisionmaking used, merging the military strategic actor model with the organizational and bureaucratic behavior of the VPVO, thus provides a richer and more accurate representation of the Soviet defense decisionmaking process than either model alone.

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CHAPTER 1

INTRODUCTION

1.1 Why Air Defense?

Over the past 40 years the USSR has built up and maintained an immense air defense force consisting of over 9,000 surface-to-air missiles (SAMs), some 2,200 interceptors and a network of 10,000 radars.[1] Herbert York has estimated that since 1948 the Soviets have spent over $500 billion dollars on air defense, compared to $50 billion for the U.S..[2] In an era when the ballistic missile is dominant what purpose does this force serve? Do the Soviets expect it to allow them to fight and win a nuclear war, and if so how? Is it just a reaction to the remaining large U.S. bomber force? Is it an example of bureaucracy run amok, continuing to maintain forces despite a diminishing threat and poor prospects for effectiveness? While there have been many such conjectures concerning the Soviet air defense forces (*Voyska protivovozdushnoy oborony--VPVO*, or Troops of the Air Defense) there have been very few studies of the evolution of this force and the reasons behind its existence.[3] In this dis-

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1 Department of Defense (1987; 59).

2 York (1987; 9, 24).

3 The Air Defense Troops underwent a reorganization and name change in 1981, previously they were referred to as the National Air Defense Troops (VPVOS). I shall use the acronym VPVO when referring to the post-1981 service or to the service in general and the VPVOS acronym when discussing the pre-1981 service or the homeland air defense component.
The only major work to go beyond the ABM treaty debate is Deane (1980). Articles and other works include Lord (1986), Petersen and Clark (1985), Monks (1977), and the series of chapters by Jones (and later Breightner) in the *Soviet Armed Forces Review Annual*.

sertation I investigate the factors behind the creation and evolution of the VPVO, its forces and operational art.[4] To do so requires more than a historical examination of forces and literature--we need a model of how the Soviet defense decisionmaking system works in order to frame our questions and answers. Thus the second theme of this dissertation is the formulation and application of a model of Soviet defense decisionmaking that incorporates considerations of both strategic military analysis and organizational behavior. Before turning to the theory, let us briefly examine the development of the VPVO over the past forty years.

The modern VPVO may appear to be something of an anomaly, but it did not always appear so. At its inception in 1948 the U.S. bomber threat was very great--and not only the nuclear threat. Given the relatively small stockpile of nuclear weapons in the late 1940s to early 1950s U.S. strategic bombing plans called for a prolonged nuclear and conventional bombing campaign against targets in the USSR and Eastern Europe.[5] Against such a threat (turboprop bombers with conventional weapons) a strong air defense force could be expected to have a significant effect. As the nuclearization and modernization of the U.S. Strategic Air Command (SAC) progressed, though, bombers became more difficult targets and each could carry several multi-megaton bombs. But the Soviets also fielded new tech-

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4 Operational art is the term used by the Soviets to refer to a service's "strategy"--how it uses its forces in wartime and how they interact with the other armed forces. It is thus a higher level of military art than tactics, but lower than strategy which deals with the use of all the services in waging a war.

5 The Joint Chiefs of Staff "Charioteer" war plan of 1948 called for an initial attack against the USSR using 133 atomic bombs, followed in the next two years by an additional 200 atomic bombs and 250,000 tons of conventional bombs. See Cave Brown (1978; 5-7).

nology, deploying a massive system of jet fighters, radars, and the first generation of surface-to-air missiles (SAMs). Thus through the 1950s it was not clear whether the advantage lay with the offense or defense, and both sides continued to try to gain the upper hand. During this period there was at least the possibility that an effective air defense could be created.

But by 1960 a new weapon had appeared that cast the entire air defense mission into doubt--the intercontinental ballistic missile (ICBM). The ICBM was unassailable by air defense means, and while efforts to develop anti-ballistic missile (ABM) systems were accelerated the technological problems were formidable.

The U.S. and USSR reacted in very different ways to this new technology. While the U.S. (under McNamara's tenure in the Defense Department) began a long-term drawdown of U.S. air defense forces, the USSR emphasized the development of ABM systems and continued a major modernization of its air defense system with SAMs. This emphasis on air defense continued throughout the 1960s, even as the share of U.S. equivalent megatonnage (EMT) and warheads carried on bombers decreased as ICBM and submarine launched ballistic missiles (SLBMs) increased.

With the signing of the ABM treaty in 1972 the situation again changed dramatically. Many in the West viewed the treaty as Soviet acceptance of the concepts of deterrence and mutual assured destruction (MAD) and consistent with this expected the Soviets to turn away from damage-limiting and war-fighting strategies.[6] But despite these expectations,

6 For a critical review of this literature see Deane (1980; 9-11).

the Soviets continued to maintain and modernize their large air defense force, adding more SAMs and replacing old interceptors with new. The VPVO was by this time the second largest Soviet service in manpower, and while it ranked fourth out of the services in budget share this was *greater* than that allocated to the Strategic Rocket Forces.[7] This continued stress on air defense has been viewed by many in the West as evidence of continued Soviet war fighting plans, or as evidence of the VPVO just following its old patterns.

By the 1980s the VPVO began a new modernization of both SAM and interceptor forces, as well as undergoing a major reorganization of its forces. With the appearance of the new cruise missile threat the importance of the VPVO appeared to be upgraded.

Strategic air defense has thus played a major role in Soviet military policy, but we still understand very little about it. Too often it is either considered an anachronism or its forces are lumped in with those of the Soviet Air Force in simple "bean counts" of the military balance. This approach ignores the unique characteristics and missions of the VPVO and tends to simplify the development and evolution of its forces. In order to understand the rationale behind the creation and evolution of the VPVO we must examine the details of forces, weapons, and operational art. To guide the process of formulating questions and interpreting answers, however, we need to develop a model of the Soviet defense decisionmaking process.

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7 CIA (1978; 5-6). The services, in Soviet order of priority are the Ground Forces (SV), Strategic Rocket Forces (SRF), the VPVO, the Air Forces (VVS), and the Navy (VMF).

7 SRF 1st?

1.2 Modeling Soviet Defense Decisionmaking

I propose that the most appropriate model for our purposes is a hybrid of an organizational politics model combined with a unitary strategic actor model. I call this the integrated model of Soviet defense decisionmaking. This odd hybrid may seem contradictory but it is well adapted to the peculiarities of the Soviet defense structure and decisionmaking process. This model provides a framework for understanding the relationships between the principal actors in the Soviet defense decisionmaking process: the political leadership, Defense Ministry leadership, the General Staff and the services. It is a multi-level model that provides for different decisionmaking processes at different levels, with organization theory the predominant model at the service level responsible for operational art and tactics. This model is set out in the following chapter, but a few of its key points are reviewed here.

This study of the VPVO is a "plausibility probe" that investigates whether such an integrated model provides a sound explanation of the Soviet defense decisionmaking process in the case of the VPVO.[8] This model postulates that the General Staff behaves like a unitary strategic actor, assessing the threat, responding appropriately, and pursuing its own internally motivated programs. But while the General Staff is the "brains of the army" it must implement its decisions through the services, and here the possible influence of bureaucratic politics and organization theory manifests itself. Not only is the implementation phase somewhat

8 George (1979; 52).

dependent upon the services, but the services may also attempt to play a role in the upper-level decisionmaking process. Thus we have a combination of unitary strategic actor and organizational behavior interacting at different levels and with different degrees of influence. But in applying the model we must take note of several important distinguishing characteristics of the Soviet defense decisionmaking process.

First, we must recognize that the influence of the services in the Soviet military is less than that in the U.S.. This is due to the presence of a strong General Staff with real powers over resource allocation and planning. The service's domain of responsibility is limited to operational art, tactics and a shared responsibility (with the General Staff) for weapons development.

Second, many of the decisions that affect operational art and even influence strategy are made at levels well below the political leadership. The image of a military completely under the rigid control of the civilians is misleading. It is at this level, where strategy is implemented in operational art and tactics that we should expect to see the primary impact of organizational biases and distortions.

Third, while service influence may be significantly less than in the U.S., we should not automatically write it off as negligible. Through the manner in which operational art is formulated, and occasionally through attempts to directly participate in higher level decisionmaking processes, the services do exert some limited influence in the formulation of strategy.

Overall, the rationalizing influence of the General Staff may tend to mute the effects of organizational interests and bureaucratic politics.

We should therefore expect that the organizational distortions of rationality should be less prominent than in the U.S. defense planning process and limited primarily to the areas of operational art and tactics.

The evidence amassed in the following chapters shows that such a model does provide a rich explanation of Soviet defense decisionmaking and its policy outputs. Thus, the development of the VPVO over time exhibits a broad responsiveness to the external threat but many of the specific characteristics of operational art and tactics are less closely tied to external factors and show the influence of organizational behavior.

This can be demonstrated in the case of VPVO development after the ABM Treaty. While some Western analysts might argue that the continued support of air defenses without a corresponding missile defense is irrational, the continued support of the VPVO was largely due to its being assigned a mission more consistent with evolving Soviet strategy: defense of lines of communications (LOCs) and rear areas in the course of a general conventional war. But while adding this new mission, or increasing its emphasis, the VPVO still retained its homeland defense mission as a hedge against U.S. bomber developments and in the hope of being able to prevent any conventional attacks on the Soviet homeland. This decision was not the result of pure bureaucratic inertia, but instead it grew out of military needs and the capabilities of the VPVO forces then existing. On the implementation level, however, organizational behavior does seem to have influenced the outcome, as the VPVO misperceived and misinterpreted the lessons of regional conflicts that could have raised the effectiveness of VPVO forces if properly applied. Thus, at these two different levels dif-

ferent processes were at work resulting in a mixture of responsive, rational policy with inefficient implementation.

In the chapters that follow the integrated model is laid out in detail, and the evolution of the VPVO from the end of World War II to the present is examined. The importance of distinguishing between levels of decisionmaking and analysis is stressed throughout, and the implications of organization theory for VPVO internal behavior are examined in detail. Most of the analysis makes use of VPVO historical literature, as contemporary problems are often examined in surrogate discussions of the Great Patriotic War.[9] Since this literature begins in 1959 most of the debates and discussions considered will be from the 1960s through the 1980s--the period of greatest change in the VPVOS. Finally, the last chapter pulls together both the theory and data to assess the relevance of the model to Soviet defense decisionmaking and to present the overall answer to the question, why the VPVO?

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9 See Rumer (1988; 40-60).

CHAPTER 2

THEORY

2.1 Introduction

Creating a model of Soviet defense decisionmaking must be undertaken with an appreciation for the unique characteristics and traits of the institutions and actors that participate in the decisionmaking process. Most studies of Soviet defense decisionmaking have concentrated on the top decisionmaking levels, stressing the top-down creation of doctrine and strategy.[1] This concern with the top leadership (such as the General Staff) reflects the strong Soviet emphasis on centralization of military decisionmaking. Yet even within a highly centralized organization there may be room for dissent and the representation of diverse organizational interests and viewpoints. In this chapter I outline an integrated model that incorporates a multi-level and multi-stage decisionmaking process that reflects the varied levels of responsibility and power in the Soviet military establishment.

The key question addressed here is the nature of service interaction with the General Staff. In the Soviet defense structure the General Staff is a powerful actor controlling resources, information, and access to the political leadership. To what extent can the services react to or in-

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1 These approaches are categorized and examined in Meyer (1984; 257-68). Some of the best efforts to study the impact of institutional structure, organizational politics and interest groups on Soviet defense decisionmaking are Alexander (1978-9), Alexander (1984), Kolkowicz (1971), Spielmann (1978), Warner (1977), Wolfe (1979).

fluence General Staff proposals and decisions? Are there avenues through which the services can articulate their interests and directly or indirectly influence the Soviet defense decisionmaking process? Before addressing these questions we first need to set out the various levels and institutions involved in the Soviet defense decisionmaking process.

2.2 Levels of Analysis: The Soviet Defense Structure

In order to properly specify a model it is necessary to indicate at what level of analysis it is expected to function. Most models try to fit several levels with one theoretical approach. Better results may be obtained by using a model that contains interlocking sub-models corresponding to different levels of analysis.[2] Three distinct levels of the Soviet defense decisionmaking structure may be distinguished, and they are outlined below.

Level 1: The Defense Council

The Defense Council is a subset of the Politburo and the top military and foreign policy leaders that considers matters of general direction and planning of defense matters.[3] It is the decision-making body of last

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2 Alexander (1984; 9-22). The multiple-level framework and three-stage decisionmaking model are set forth in Meyer (1988).

3 The exact composition of the Defense Council is not known, but a likely list is presented below. Note that these members are not all equal in power by any means. They may, however, participate in the decisionmaking process at this level. Party: general secretary, second secretary, secretary overseeing the Department of Defense Industry (DODI). State: Chairman of the Council of Ministers, the head of the KGB and possibly the Foreign Minister and chief of the Military-Industrial Committee (VPK). Military: Minister of Defense, probably the Chief of the General Staff, and on some occasions the Commanders in Chief of the services. See Warner (1985; 4-7), Jones (1985; 6-10), and Gelman (1984;63-70) for a listing of probable members of the Defense Council. The listing here includes some players who may not be formal members of the Council, but who may participate in some decisions in a slightly enlarged arena, such as the Politburo.

resort and greatest power. Important weapon acquisition, strategy, and doctrinal issues are examined at this level.[4]

Since the Defense Council is a critical institution we may look to the definition of its responsibilities for a picture of the issues considered at this level. Jones, citing the Soviet constitution, gives the issues considered by the Defense Council as:

> (1) the review and decision of all major questions relating to maintaining the security of the country, strengthening its defensive capabilities, and developing its military potential;
> (2) determination of the basic directions of and plans for military development (including military manpower procurement policy);
> (3) direction and coordination of the work of the entire Soviet state apparatus, making sure that defense interests are considered in deciding all matters of state administration.[5]

The issues considered by the Defense Council are thus very broad, dealing with doctrine and overall defense planning, rather than specifics of operational art or weapons acquisition.[6]

The relative power of the Defense Council members varies widely and the ultimate decisionmaking power lies with the Politburo members on the Defense Council. While the top military leaders (Minister of Defense and perhaps Chief of the General Staff) may play some role in formulating

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4 Note that this set of top leaders does not correspond well to Mills' definitions of leadership circles. Instead of envisioning the leadership as concentric circles, as does Mills, this approach skims the upper strata from three groupings for a specific decision-making area. See Mills (1981; 592-596).

5 Jones (1985; 7).

6 During wartime the Defense Council would become the State Defense Committee (GKO) that would directly oversee the war effort and the work of the General Staff.

draft decisions and discussing options and might be expected to represent bureaucratic interests, their power and influence is very limited in comparison to the other members. Indeed, in many respects the military leaders are cast more in the role of supplicants.[7]

Level 2: Strategy and Coordination

At this level doctrine is realized in strategy, resources are allocated, plans for the services are integrated, and war plans drawn up. The chief role is played by the General Staff, and by the Collegium of the Ministry of Defense. The General Staff has overall responsibility for coordination and scrutiny of the services' plans, while the collegium appears to be more a forum for collective decision-making between the services and other parts of the Ministry of Defense.[8] The Collegium may be a principal forum for bureaucratic politics between the services. At this level there may also be participation by the Party secretary responsible for defense industries, as well as the Chairman of the Council of Ministers, and the Ministers responsible for the various defense industries.[9]

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7 This is particularly true for the period when Dmitry Ustinov was Minister of Defense and a Politburo member. Ustinov did not act as a military representative advancing the military's interests, but rather as the Party's man put in place to oversee and restrain the military. During this period, then, the military's bureaucratic representation on the Defense Council was very limited.

8 Jones (1985; 12-22).

9 Party: CC secretary for DoDI, CC department head for administrative organs, Politburo members with special defense interests. State: Council of Ministers, defense industry ministries, the Military-Industrial Committee chairman. Military: Minister of Defense, the General Staff, the Commanders in Chief of the services, Deputy Ministers of Defense.

Level 3: Operational Art and Weapons Specification

The third level is service-centered. The service staff is one of the primary actors, as are the service Commanders in Chief and the heads of the branches. There is some symmetry between this level and that of level 2: where the primary issues at level 2 were inter-service, here the issues are intra-service and inter-branch. This level performs several crucial functions, developing operational art, detailed specification of weapons and direct oversight of weapons development.[10] In these areas the services come into contact with other actors: the Central Committee, Department of Defense Industry (DoDI), designers and design bureaus, defense plants, research institutes, and other participants in the weapons acquisition process.[11]

The three levels examined above clearly differ in their power and responsibilities, and it should not be surprising that they also differ in their decisionmaking processes.

At the top level the Defense Council is a small, diverse group without clearly defined institutional interests and may perhaps best be modeled by a conflict approach. It may also be highly dependent upon the personality and power of the General Secretary.[12]

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10 On the weapons development and acquisition process, see Alexander (1978-9; 31-32).

11 Party: Central Committee DoDI, Military-Political Administration (MPA). State: defense ministries and administrations, design bureaus and plants, industry and Academy of Science research institutes. Military: Commanders and deputy commanders of the services, the General Staff, service staffs, branch of service heads, possibly Military District commanders.

12 In this case traditional "kremlinology" is the accepted method for determining the power balance in the Politburo and hence the Defense Council. At this level considerations of personal power, personality, coalition formation may strongly influence the positions taken by the actors,

Conversely, level 2 appears to be more homogeneous, as it is composed primarily of military personnel, and the differences in power are less. But while these personnel may share some common values and interests, on a more specific level they can be expected to have diverse institutional and personal interests.

At level 3 the services may be expected to behave as do other large organizations, trying to further their own interests and exhibiting the characteristics of organizational behavior discussed below.

A successful model of Soviet defense decisionmaking must be able to incorporate these different levels, their responsibilities, and the different decisionmaking dynamics at work.

2.3 A Model of Soviet Defense Decisionmaking

Given these three levels in the Soviet defense decisionmaking process, how can we fit them together into one model? Since there have been many studies of the top level, I intend to focus on the problems of strategy and operational art--levels 2 and 3. At these levels the dynamics of the decisionmaking process are quite different from the top level, and I propose that a model integrating the unitary strategic actor model of the General Staff and the organizational politics model of the services will provide the best explanation of Soviet defense decisionmaking. For want of a better term, I shall call this the *integrated model* of Soviet defense decisionmaking.

_____(continued)
and a bureaucratic politics model does not appear to apply.

How can we model the role and influence of the services and the General Staff on Soviet defense decisionmaking? I argue that the General Staff is the unitary strategic actor at the core of the decisionmaking process, weighing the threat in a relatively unbiased manner and determining Soviet responses to it, as well as pursuing its own programs to further develop the Soviet force structure. Unlike the Joint Chiefs of Staff in the U.S., the General Staff has a viewpoint that supersedes that of the services, and it has the power to carry out its decisions.[13] The General Staff therefore functions as an actor that behaves in a manner consistent with the balance of power theory. As Posen has indicated in his study of military doctrine, balance of power theory presents the best explanation of military doctrine, and in the Soviet case the General Staff is the body that has primary responsibility for ensuring balancing of military strategy and military-political doctrine. We therefore expect the policy decisions of Level 2 to reflect the General Staff dominance and be broadly rational and tied to the external threat, rather than the product of organizational politics.[14]

Given the strong role for the General Staff, the domain of responsibility and the power of the services is more limited than in the U.S.. The services do have responsibility for the elaboration of operational art, and share responsibility for weapons development with the General Staff. While more constrained than in the U.S. these areas of responsibility present opportunities for service interests to influence the final outcome of the decisionmaking process.

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13 Rice (1987).

14 Posen (1984; 220-41).

The services exhibit behavior characteristic of large organizations and can best be represented by a model based on organization theory. An organizational politics model has been selected because the work of Posen has indicated that at the level of operational art, organizational interests and the institutional structure of the decisionmaking process may have a significant effect on policy output. Furthermore, Posen's work suggests a number of characteristics of organizational behavior that appear to be applicable to the Soviet services and defense decisionmaking structure.[15]

The interaction of these two levels and models is characterized by neither a rational actor nor organizational model, for different issues may produce a different mix of factors and the two models fit different levels of analysis and problems. Throughout the course of this dissertation the role and influence of these two levels will be examined in order to determine their relative weight in the overall decisionmaking process.

One element of the integrated model is a multi-stage framework for decisionmaking. Three stages are envisioned: 1) agenda-setting and advocacy, 2) decision, 3) implementation. While these stages may occur at any of the levels of the decisionmaking structure, there are strong associations between some of the stages and levels. For strategic-level issues agenda-setting, debate and decision would occur primarily at level 2 while implementation would be the responsibility of the service level. In the course of implementing any such decision, though, further issues arise and more decisions must be made. Many of these decisions will be made at

15 Posen (1984; 222-8).

the service level, again through a multi-stage process. With this framework, then, we may see a number of iterative decisionmaking processes flowing from one initial decision, with the subsequent decisions occurring at ever lower levels. The crucial nexus is that between decisionmaking and implementation, for if the decision is made at level 2 then implementation usually takes place at level 3 and below. In passing between levels the intent of the decision may be altered as problems of its realization are confronted and as the subordinate organizations filter the decision through their own interests, capabilities, and perceptions. Thus, we can expect final outputs from the implementation stage that have travelled through a number of intervening levels and that might come out quite differently from what the decisionmaker intended.

Of particular interest are issues that "bubble up" from the service level, a phenomenon not usually expected in a highly centralized structure. An issue may arise within the service which may then attempt to place it on the agenda of higher level bodies (such as the General Staff), where the issue is debated and service positions articulated. The decision may be made at the General Staff level, and then returned to the service for implementation. Issues may therefore move between levels at different decisionmaking stages and may be traced as they go from level to level. For example, if a program becomes very expensive it may attract the attention of the political leaders and the other services. In such a case the program may move up from level 3 to the upper levels, requiring more than formal approval from them. Such a phenomenon may have taken place in the case of ABM deployment in the late 1960s.

Thus, the model is able to accommodate issues that arise at different levels of the decisionmaking structure and track the movement of these issues through the structure and decisionmaking stages, while also taking into account different decisionmaking processes at the different levels. The foundations and implications of these decisionmaking processes at the different levels are examined in the next sections.

2.3.1 Level 2: The General Staff

The Soviet General Staff plays a critical role in Soviet defense decisionmaking in that it occupies a position that transcends that of the services and frees it from service biases and interests.[16] Such a position implies that the General Staff may come close to the ideal of the "rational strategic actor" even though it may have its own organizational interests and biases. At the very least it serves as a high level integrator and mediator of service interests, imposing a central allocation of resources and priorities that is intended to produce a more tight coupling between the services and national strategy. While the services may attempt to engage in bureaucratic politics, the General Staff is clearly the primary power, and has the capability to mediate, and probably to decide, on a wide range of issues concerning the services.[17]

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16 One important reason for this is that a General Staff officer does not usually rotate back into his service and his promotion path is determined by the General Staff. Thus an effort is made to engender loyalty to the General Staff rather than to the services. This is quite a different dynamic than that operating in the Joint Chiefs of Staff where, until recently, officers were rotated through and promotions were determined by the services. See Scott and Scott (1984; 117).

17 For discussions of the power and influence of the General Staff see Rice (1987), Warner (1985; 14-16), Meyer (1985). Furthermore, the high stature of the Chief of the General Staff may make it easier to get higher-level support for General Staff recommendations for decisions that exceed the power of the General Staff to enact by itself.

It is the General Staff that has the responsibility for implementing the military-technical side of doctrine, developing strategy, war plans, overseeing weapons development, and coordinating the work of the many services and branches of the military.[18] Furthermore, the General Staff is the main repository of military expertise and knowledge, giving it an important source of influence and authority that is denied to civilian institutions in the decisionmaking process.[19] All these responsibilities and assets give the General Staff a role quite different from that of the U.S. Joint Chiefs of Staff.

The interaction between the services and the General Staff is an important factor affecting Soviet defense policy and force structure. First, in implementing decisions made by the General Staff the services may have a strong influence on the final form, and even success or failure, of those decisions. Second, the services may attempt to influence the decisionmaking process in order to further their own interests. Third, the operational art developed by the services may influence the development of strategy and doctrine through the military leadership's perceptions of the capabilities, effectiveness, and methods of use of forces. Fourth, many of the issues that fall under the service's jurisdiction may have significant effects on U.S. perceptions of Soviet strategy and doctrine as the U.S. "rationalizes" what may be lower-level operational decisions as high-level strategic decisions.

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18 During wartime the General Staff would be reconstituted as the Staff of the Supreme High Command (**Stavka VGK**), and would bear direct responsibility for overseeing combat operations, particularly those of the strategic nuclear forces.

19 Meyer (1985; 41-47).

In this model the General Staff is seen as an integrator and as a powerful actor in its own right. It comes close to being the standard rational military actor. Yet the General Staff's decisions are implemented by the services, which have their own interests and biases. It is in the implementation of these decisions that the effects of organizational politics may be most strongly felt.

2.3.2 Level 3: The Services

If the General Staff is a unitary strategic actor, then the services appear to be best represented by a model based on bureaucratic politics and organization theory. These two approaches to organizational behavior are integrated here in an organizational politics model. Organizational behavior directed externally (e.g. advocacy of interests) is modeled by bureaucratic politics, while internal behavior (learning behavior, decisionmaking) is modeled by organization theory.

The bureaucratic politics model predicts that policy will be shaped by the interaction of bureaucratic interests and the actors representing them. While other factors are included in the model the decisionmaking process is seen as a game in which the various actors advocate their interests and attempt to sway the decision in their favor.[20]

Do Soviet military leaders behave like bureaucratic actors? This question is critical to the success of the organizational politics model.

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20 The standard works on this topic are Allison (1971), and Allison and Halperin (1972). Studies employing the bureaucratic politics model include Halperin (1972), Valenta (1979), the papers collected in Halperin and Kanter (1973). For cogent critiques of the model see Freedman (1976), Nathan and Oliver (1978).

Certainly, there is reason to doubt that models and theories may be transported across cultures and still retain their validity.[21] Nevertheless, with appropriate adaptation to the specifics of Soviet culture and organizational structure the bureaucratic politics model should fit and provide insights into the Soviet defense decisionmaking process.

Do Soviet military leaders behave like bureaucratic actors? The answer is a qualified "yes." Military leaders do appear to be proponents of increased defense spending and do advance their own service interests.[22] Indeed, there is every reason to believe that the bureaucratic politics model works best in dealing with military organizations where loyalty to the service is highly valued, career advancement is determined by the service, and the players spend a long time in their service absorbing its traditions and values.[23] Top military positions are usually

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21 This is the basis of Dawisha's (1980) arguments against the use of bureaucratic politics in the Soviet context.

22 For discussions of this topic see Kolkowicz (1971), Marshall (1971), Warner (1977), Khrushchev (1974; 25-28), Valenta (1979). One of the most interesting results of Valenta's study of the Soviet decision to intervene in Czechoslovakia is that the military was at the forefront of the interventionists. This is in keeping with the bureaucratic interests of the military, and is consonant with the interests imputed to the U.S. military by Allison.

23 Western studies of military organizations stress the process of socialization and professionalization. Thus, Huntington (1957; 7-79) elaborates a "professional military" ethic that is theoretically applicable to officers in all nations. An important component of socialization is the identification of the officer with the military service, a loyalty that in theory is subsidiary to his dedication to the country, but which in fact becomes intertwined. An officer with long service in a service may be expected to have to some degree absorbed the values and outlook of that service. Jones (1985; 92-94), however, notes that this identification with the service may be somewhat less in the USSR than in the U.S. and ties to the services may be weaker in the USSR than in the U.S. Also note that there is greater cross-service mobility than in the U.S., although not so much in the Brezhnev years.

filled by officers who have risen through the ranks of a service and have had a long time to absorb the values and interests of their service.[24] Furthermore, they have usually reached the apex of their career, for there are few higher positions that a service chief might aspire to, particularly if he is not a Ground Forces officer.[25] This may make the service chiefs less concerned with the views of the General Staff and the civilian leadership. This is particularly true during the Brezhnev period where "stability of cadres" resulted in most officers being promoted from within and when only the most grievous errors (or illnesses) would result in a service chief being removed.[26] Hence the service chiefs are in a good position to become advocates for the interests of their service.

What are the interests of the services? There are strong pressures on the heads of bureaucracies to enhance their own position and to increase the resources available to the bureaucracy.[27] The services may

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24 There may, indeed, be some careerism but it is most likely to be furthered by loyalty to the organization that does the promoting--the service (and one's direct superiors). See Downs (1967; 92-5).

25 The General Staff is dominated by (former) Ground Forces officers and it is rare for a non-Ground Forces service chief to be promoted to Chief of the General Staff or other high (First Deputy Chief) position. Biryuzov (who headed the VPVOS then the Strategic Rocket Forces) is an exception--he seems to have been Khrushchev's crony and supported the Cuban missile plan. Another exception is Batitskiy, who was briefly First Deputy Chief of the General Staff before being appointed Commander in Chief of the VPVOS. Again this was during Khrushchev's time when loyalty to Khrushchev took priority over other characteristics. Both Biryuzov and Batitskiy also had Ground Forces experience during the war and the post-war years.

26 Gorbachev's approach of shuffling service chiefs appointing chiefs from different services (e.g. Maksimov, Tret'yak) may be directly aimed at this problem, as well as indicating a need to "clean house" in some of these services.

27 Downs's work provides great insight into the generation of bureaucratic interests and the interaction of bureaus with other organizations and the environment. Downs (1967; 93-95, 103-111). Military services are a particularly fitting example of bureaucracy as they provide a good (national security) that is very difficult to measure and assess during peacetime. See Downs (1967; 24-25) for the criteria for a bureaucracy. Downs often

stress the need for greater resources and may act to protect their missions and domains of responsibility from encroachment.[28] To facilitate the advocacy of the organization and to ensure the indoctrination of personnel the bureaucracy may also develop a bureaucratic ideology that presents the roles, missions, goals and values of the bureaucracy to both external and internal consumers. Such an ideology, if accepted by those responsible for resource allocation, can be a significant tool in advocacy for increased resources.[29]

The scope for service advocacy is more limited than in the U.S., for there are no outside avenues of appeal (for example to the Congress). The external behavior of the services is primarily directed towards the General Staff, rather than a direct appeal to higher civilian authority.[30] The range of actors in the decisionmaking process is also restricted by the monopoly of the military on military expertise. This monopoly results in debates and arguments being largely played out within the defense community, rather than expanding to civilian experts.[31] The number of

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refers to military services as bureaucracies, see for example Downs (1967; 199-200).

28 Downs (1967; 211-222).

29 Downs (1967; 237-46).

30 In the U.S., of course, appeal to Congress or even to the President is a time-honored way of performing an end-run around the Secretary of Defense or other top-level opposition. Given the level of centralization it is rather unlikely that similar avenues are open to Soviet service chiefs. Khrushchev does, however, recount one episode in which the Commander of the Navy attempted to reverse a decision by direct personal arguments. The attempt failed, and the admiral was replaced. Khrushchev (1974; 25-27).

31 Civilian experts in the defense industries may be involved, but their influence is much less than civilian analysts or defense industries in the West.

participants in a debate is therefore rather restricted and the same actors may appear in a number of different decisions, a factor enhanced by the relative longevity in position of most top military leaders.[32] All of these factors tend to limit the range of debate, particularly the desire to settle military matters "in-house."

The bureaucratic politics model gives rise to a number of propositions concerning the service's interaction with other parts of the decisionmaking structure.[33] In the case of the VPVO these propositions may be summarized as:

Propositions Concerning External Behavior.

Interests and Advocacy:

--The VPVO will act to maintain or increase its size and wealth, thus it may not only advocate its current missions, but may also advocate expansion into other areas if sufficient resources are provided.

--The Western threat may be inflated in order to support VPVO requests for funding. At the same time, the threat must be presented as being manageable and not overwhelming.

--Inter-service rivalry may be evident over both resources, mission allocations, and means of interaction. However, the General Staff may enforce some level of integration producing a "negotiated environment" between the services.[34]

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32 The phenomenon of a number of recurring players fighting over decisions may result in a the gradual increase of personal considerations in technical decisions as old grudges and vendettas build up. Unfortunately there is no contemporary evidence that allows us to examine these sorts of factors in the decisionmaking process, although the memoir literature certainly points to the prevalence of inter-personal conflict among the top military leadership.

33 Posen (1984; 41-59).

34 Posen (1984; 53-54).

While the bureaucratic politics model provides a useful framework for examining the interaction of the service with other institutions, it says nothing about the internal mechanisms and behavior of the service. For this we must turn to organization theory.

The classic statement of organization theory by March and Simon is taken as the point of departure for this study as it presents a clear, coherent framework that lends itself to the derivation of propositions that can be tested against data. It is supplemented by Downs's work on bureaucracies. For our purposes the elements of organization theory may be broken into several topics: decisionmaking, inter-branch behavior, learning behavior, and institutional history.

The decisionmaking theory proposed by March and Simon is perhaps the most important aspect of organizational theory. The work of March and Simon moved away from earlier value-maximizing, rational actor concepts of organizational behavior to introduce the concept of "satisficing," relaxing the need for a wide-ranging search of all possible options.[35] It posits that a more easily reached satisfactory option would be preferable to a more distant optimal option.[36] The importance of searching for solutions in the problem area, and of employing standardized procedures for decisionmaking (standard operating procedures -- SOPs) was also emphasized.[37] Both of these decisionmaking processes lead to incrementalism

35 March and Simon (1958; 140-41).

36 March and Simon (1958; 136-142)

37 Cyert and March (1963; 101-113,114-127), Downs (1967; 175-84). March and Simon (1958; 141-50) refer to SOPs as performance programs, the term SOPs appears in Allison (1971; 67-8).

and conservatism, as well as a willingness to settle for suboptimal solutions to problems.

March and Simon also recognized that an organization's internal behavior may play an important role in decisionmaking and organizational output. Divisions of an organization may have their own values and goals, and conflict among sub-units may be endemic. This conflict may prevent the formation of all but the most general overall organizational values and goals, with decisionmaking less a function of consensus and rational argument than a struggle for divisional power.[38] The organization thus moves even further away from the ideal of rational decisionmaking. Even within such a context, however, the basic agreement on core values (for example, creating an air defense system) may provide a basis for continuing organizational interests and advocacy.

With respect to organizational learning, outside stimuli and experience may be filtered through the organizational interests and mindsets, resulting in inefficient and misdirected learning behavior. This process is very similar to that of decisionmaking, for the information is processed and responded to through much the same channels using similar procedures.[39] Thus reponsiveness to an external stimulus may vary and not necessarily be appropriate to the stimulus.

Do Soviet bureaucracies fit the model provided by organization theory? There is now a sufficient body of literature on Soviet bureaucracies to indicate that they do indeed follow the broad outline of

38 See Cyert and March (1963; Chapters 3, 6) and Elmore (1978; 217-226).
39 Downs (1967; 179-83, 191-204), March and Simon (1958; 139-41).

behavior sketched above.[40] While there may be exaggerations or distortions in some areas of behavior, the basic picture remains accurate. Thus, in the USSR there appears to be a premium on avoiding responsibility for making controversial decisions--"passing the ruble" up to a higher authority is a common means of avoiding decisions.[41] This tendency has several consequences: it increases centralization, it increases the time for decisionmaking, and may reinforce tendencies to inertia and incrementalism as all levels seek the least-controversial decision. Furthermore, as the problem gets sent to ever higher levels the possibility of its being "lost in the shuffle" or overlooked increases, and so problem-solving by flight or oversight becomes even more likely.

This avoidance of responsibility and high risk-aversion might have an effect on the level of advocacy. Some studies have shown that the Soviet defense industry is reluctant to take on technologically challenging tasks because of the high risk involved and the penalties for failure.[42] Thus, instead of pressing for newer, more modern arms they tend to advocate incremental innovation and simpler weapons that they can reliably design and produce.[43] In the military services this risk-aversion may manifest itself by a tendency to keep missions relatively simple but at the same time to increase resources in order to accomplish those missions more reliably. Thus, there may be less of a tendency for an organization

40 A number of studies in various areas have examined Soviet bureaucratic and organizational behavior. See, for example, Alexander (1978-9), Berliner (1976), Hough (1977), Spielmann (1978), Warner (1977), Wolfe (1979).

41 Alexander (1978/9; 29-30).

42 Alexander (1978-9; 28-9).

43 Alexander (1978-9; 31).

to seek to expand its domain of responsibility unless there is a greater offsetting increase in available resources to ensure that the responsibilities do not overrun the resources.[44] In this case we still expect to see advocacy for increased resources. Furthermore, if the new responsibility is viewed as closely related to the core mission of the bureaucracy strong advocacy may be mounted for both the increased role and for the necessary resources.[45]

Finally, the role of incentive structures in Soviet bureaucracy is also important. Berliner has shown how incentive structures in Soviet industry stifle innovation and there is evidence of similar tendencies in the military services, where "rocking the boat" may be even more discouraged. The strong emphasis on fulfilling norms, and the incentives provided for this also has a strong effect on the performance of work. In the military if performance measures do not measure true combat performance or reward non-realistic training the incentive structure could have a profound impact on the effectiveness of the forces. This aspect of the problem will be dealt with in more detail in a later chapter.

Overall, then, there are good reasons for believing that the model sketched out above should apply to Soviet bureaucracies and to the military services.[46] Again, this theory gives rise to certain propositions concerning the organizational behavior of the services. Following some of Posen's extrapolations from organization theory[47] and the general proposi-

44 Downs (1967; 195-97).
45 Downs (1967; 198-200).
46 Alexander (1978-9), Warner (1977; 1-103), Wolfe (1979; 49-77).
47 Posen (1984; 41-59).

tions described above we may draw a number of propositions concerning the VPVO's likely behavior:

Propositions Concerning Internal Behavior

Decisionmaking:

--The VPVO will develop standard operating procedures (SOPs) for both operations and planning. A form of "bureaucratic mindset" may also be developed.

--We expect to see incremental innovation in operational art and tactics, with conservatism prominent.

--Weapons should show slow innovation rates, and incremental design.

--The VPVO may deploy obsolete weapons, or weapons that are not optimized to meet the threat.

--Force structure and deployment should remain fairly constant over time and may not be rapidly responsive to changes in strategy or operational art.

--Organizational changes may be very slow, unless imposed from outside or triggered by catalytic events.

Inter-Branch Behavior:

--Inter-branch Conflict: There may be contention between the branches as to how to provide the most defense for the money. This is particularly likely between the Surface-to-Air Missile Troops (SAM Troops) and the Fighter Aviation branch (IA VPVO).

--The mix of SAMs and aircraft may shift if one branch or the other gains a dominant position in the service.

Learning Behavior:

--Lessons learned from the combat experience of local wars will be filtered through the existing biases and preconceptions of the service and data tending to challenge strongly held views will be discounted. Lessons will thereby tend to confirm existing views or policy or will result in incremental change.

How can we use this model to understand and explain organizational behavior? In the next section the means and methods of applying the model

are examined.

2.4 Applying the Model

In applying the integrated model we are interested in discerning the relative influence of the General Staff and the services. To do so the evolution of the VPVO over time has been examined, breaking it down into a number of specific "choice opportunities," periods during which changing technology and doctrine raised a number of important issues pertaining to operational art and strategy. During each of these periods the relative influence of the two levels is assessed by examining discussions and arguments concerning the VPVO and their outcomes.

One important measure of the interaction between the General Staff and the VPVO is the extent to which the propositions of the "pure" organizational politics model are moderated by the unitary strategic perspective of the General Staff. Thus, in the absence of the General Staff we would expect the organizational politics model to be the dominant model explaining VPVO policy. With the General Staff, however, we should expect different results as the General Staff limits the assertion of organizational interests. Thus, many of the propositions listed above may be less prominent in the Soviet case than in the U.S.

Conversely, the organizational politics model also proposes that the output of a pure General Staff dominant model will be mediated and influenced by the organizational politics model, producing distorted outputs. By merging the General Staff dominant and organizational politics models we may therefore arrive at a richer appreciation of the factors in-

volved in Soviet defense decisionmaking and the interaction between decisionmaking levels.

To test the propositions about the VPVO's behavior an understanding of the VPVO's operational art and missions is crucial. To this end, content analysis of Soviet military sources is used to discern the critical elements in the VPVO's operational art and how they change over time. By relating these changes in operational art and mission to the overall strategic picture and Soviet force posture, an understanding of the VPVO's response to internal and external developments will emerge. The relation between changes in operational art, perceptions of the threat, and the state of the threat will be examined, looking for indications of VPVO responsiveness to threat stimuli.

The study is chronological in nature, in order to capture the evolution of VPVO operational art and events in the decisionmaking process. Four broad periods will be examined: the formation of the VPVO (1948-60), a pre-ABM treaty period (1960-1972), a post-ABM treaty period (1972-1980), and the reorganization period, 1981-1986. These periods also roughly correspond to periods of change in Soviet doctrine and strategy: the nuclear-oriented Revolution in Military Affairs, the transition to greater conventional capability, and the later conventional phase. Events of interest such as the interceptions of the KAL airliners in 1978 and 1983, and the Vietnam and Mid East wars are treated within these periods. On the doctrinal and strategic levels, attention is paid to the VPVO's justification of its role and mission within the context of Soviet military doctrine.

In the chapters that follow the divergence from the General Staff rational-actor model will be stressed. We will examine the role of orga-

nizational interests and influences in the decisionmaking process and determine to what extent these influences distorted the output expected from the rational actor model.

2.5 Sources

The problems of sparse data and low signal-to-noise ratio are always present in the study of Soviet defense policy. By looking at a specific service, and for certain themes, it is possible to conduct a study with a high level of detail over a long time span. This should allow maximum use of the available data.

The basic source of data is a content analysis over time of Soviet writings on the VPVO ranging from 1959 to the present. Primary sources are the Soviet military journals *Vestnik PVO* (*PVO Herald*), *Voyenno-istoricheskiy zhurnal* (*Military-Historical Journal*) and the restricted journal *Military Thought*, as well as Soviet books on the VPVO. These sources present some clear and illuminating discussions of VPVO operational art and tactics that allow many of the propositions listed above to be tested.

VPVO deployments, weapons, and force structure must also be examined in order to fully understand the VPVO's capabilities and the relationship between the writings and reality. Data on force structure has been obtained from a variety Western sources. Of particular concern is whether there appears to be a lack of consonance between operational art and force structure. Such a difference may be explained through the different organizational processes used to produce the two outputs, a matter that will be examined in more detail in later chapters.

2.6 Summary

The model outlined here presents itself as an effective tool for describing Soviet defense decisionmaking. It has two major aspects: 1) the explanation of internal service behavior, especially operational art, and 2) the interaction between the service and the General Staff. By examining the VPVO's evolution with an organizational politics model we may gain important insights into the place of strategic defense in the broader context of Soviet defense policy.

The following chapters trace the evolution of the VPVO from its inception to 1986 with special attention to the theoretical aspects raised by choice opportunities (the ABM debate, the reorganization debate, reactions to local wars). The relevance of the organizational politics model to VPVO operational art and force structure is stressed throughout, but the primary evaluation of the model is deferred until the Conclusions chapter.

CHAPTER 3

THE EARLY DEVELOPMENT OF THE VPVOS

3.1 Introduction

The VPVOS was not created from thin air. Instead the nature and structure of the new service was strongly determined by the long-term evolution of Soviet air defenses, particularly the crucial testing of the Great Patriotic War.[1] During the war the VPVO's organizational structure and operational art received great attention and the lessons of the war played a major role in the structure and operational art of the post-war period. In this chapter the early origins of the VPVO are briefly traced, setting the stage for the war, and the war years are examined in some detail.

3.2 The Inter-War Period: 1918-1941

Towards the end of World War I aircraft became an important military instrument and the creation of effective air defenses became an issue of great concern for the warring parties. Early air defenses were created around cities using fighter aircraft and artillery modified to fire at large angles against aerial targets. In Russia defenses were established around important cities such as Petrograd and Odessa. For observation

1 The Soviets refer to the war on the Soviet-German Front as the Great Patriotic War. This is contradistinction to the term World War II, which refers to combat in all theaters of war. This usage is convenient and will be employed here as well.

and warning a special service (the *voyska vozdushnaya nablyudeniya, opoveshcheniya i svyazi--VNOS*, or Troops of Air Observation, Warning and Communications) was formed.[2] Point defenses were created around the city and particular targets within the city and there was little centralized command and control at the regional or national level.[3] Throughout the war, though, there appears to have been little air activity against Russian cities, the bulk of German airpower being concentrated against the Western front.

After the October revolution the Bolsheviks inherited the PVO system of the Russian army. Despite the attempts of VPVO historians demonstrate Lenin's great interest in PVO, the PVO appears to have played little role in the civil war or the war with Poland, as neither adversary had significant quantities of aviation able to reach important objectives.[4] Instead, air defense appears to have been primarily an issue of tactical concern with air combat the primary means of defense.

During the 1920s and 1930s the main problems in establishing an effective PVO system were elucidating the operational art and creating an efficient organizational and command structure. As airpower became a stronger force and the perceived Western threat grew larger, these ques-

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2 See Svetlishin (1964) for a detailed discussion of the Petrograd and Odessa defenses, especially page 105 for the VNOS forces. Information on the general system of PVO of Russia may be found in Batitskiy (1968), Chapter 1. A short overview of the development of the PVO is presented in Batitskiy (1976b; 316-321) and a slightly more comprehensive version may be found in Ashkerov (1960; Chapter 1).

3 Svetlishin (1964; 109-110).

4 On the attempts to invoke Lenin's blessing see Batitskiy (1968; 18-22). Attempts by PVO historians to portray a major role for the PVO in the civil war seem very strained, suggesting that its real role was fairly insignificant. Similarly, the Polish war is hardly mentioned, again suggesting little role for the PVO. See Batitskiy (1968; 9-17).

tions received much attention from Soviet military theorists and arms developers.

In 1924 the first PVO regiment of *zenitnaya artilleriya* (anti-aircraft artillery--AAA) was formed, followed in 1927 by the first AAA brigade. The PVO system maintained a structure with point defense lying within PVO sectors created in the border military districts. These sectors were headed by combined-armed officers who had a number of other responsibilities, with the exceptions of Moscow and Leningrad, where there were established PVO posts. Warning (VNOS) posts were created throughout the frontier military districts.[5]

In 1927, as part of the military reforms proposed by Frunze, a PVO department was created in the Red Army staff.[6] During the 1920s the bases of PVO operational art were established by a number of theoreticians, particularly N. A. Borodachev. Borodachev argued for a delineation between defense of the front line (troop PVO) and defense of the rear of the nation with the latter a separate force. PVO was presented as a complement to a strong air and ground offensive that would destroy enemy aviation both on the ground and in the air.[7] Tactics for fighter aviation (*istrebitel'naya aviatsiya--IA*) and AAA were also worked out during the 1920s.[8]

5 Batitskiy (1976; 317), Batitskiy (1968; 30-31).

6 Batitskiy (1976; 317), Batitskiy (1968; 43).

7 Svetlishin (1979b; 76-77), Svetlishin (1974; 81-82). There are some difficulties with the use of these secondary sources: the views of early authors are sometimes distorted to make points relevant to contemporary issues. The context and nature of these two articles suggests, however, that they are basically historically correct although there may be some changes in emphasis from the original.

8 See Svetlishin (1979b; 77).

The development of the PVO system received even more attention in the 1930s. In 1930 the PVO department was reformed as a directorate and charged with developing a PVO plan for the entire country for 1930-1933. A new decree concerning PVO was also promulgated, establishing PVO objectives at important centers and establishing the post of Chief of PVO for the point, appointed by the People's Commissariat for Military and Naval Affairs.[9] The Chief of PVO would have operational control of all PVO and civil defense forces at the objective, regardless of their service affiliation. In the military districts with PVO sectors independent PVO departments were created and the formation of separate AAA batteries and regiments was continued.[10]

In 1932 the PVO was removed from its subordination to the Red Army Staff and was reformed as a PVO Directorate directly subordinate to the USSR Revolutionary Military Soviet (*Revvoyensovet*), the highest military body of the nation. The PVO Directorate, headed by S. S. Kamenev led the PVO service for the entire nation. In the military districts PVO directorates were created, headed by a PVO Chief for the military district with direct leadership of PVO preparation and special PVO and civil defense units of the district. The PVO Chief of the military district was directly subordinate to the military district commander, and only "in special relations" subordinate to the Chief of the PVO Directorate.[11]

This organizational structure has several important features. First, it increased the prominence of the PVO, placing it at a high

9 Soviet sources use the word objective to designate a defended site or point. This avoids confusion with the word "target" which can mean either the defended target or the attacker being targeted.

10 Batitskiy (1968; 44-45).

11 Batitskiy (1968; 44-45), Batitskiy (1976; 317).

strategic level. Second, it created a system where the PVO had forces designated to it, but had few forces of its own. Third, while establishing a national-level leadership, most of the control and power remained at the military district level. The Chief of PVO for the military district was responsible to the district commander, rather than to the Chief of the PVO Directorate. Thus the problems of dual subordination of both PVO forces and leadership that were to become so critical in the early period of the Great Patriotic War were first incorporated in this early organization of the PVO.

The tendency towards creating larger AAA units continued during this period with the creation of the first AAA divisions and the augmentation of PVO units around Moscow, Leningrad and Baku. Then in 1937 the first PVO corps were created around these cities while PVO divisions were created around other centers.[12] The PVO corps were "combined arms" units in that they included AAA divisions, searchlight (*zenitnyy prozhektor--ZP*) regiments , antiaircraft machine-gun (*zenitnyy pulemet--ZPl*) regiments, aerostat (*aerostat zagrazhdeniya--AZ*) regiments and VNOS warning regiments. Separate brigades were created for the defense of smaller objectives. Fighter aviation designated for the PVO remained as part of the Soviet Air Force (*voyenno-vozdushnyye sily--VVS*), although in time of war they would be under the operational control of the PVO Chief of the military district.[13]

12 Batitskiy (1968; 45-46).

13 Batitskiy (1968; 46-47). Technically, the Air Force was the Red Army Air Force, but the modern term will be used here to avoid confusion. On Soviet Air Force organization at the beginning of the war see Kozhevnikov (1977; 43-46).

Most of the organizational changes in the 1930s reflected a trend towards larger PVO forces and the integration of many different branches into combined arms units. Control, however, still remained at the military district level.

The years 1940 and 1941 saw more reorganizations of the PVO as the results of the Finnish wars and the German attacks on the Western front were assimilated. These changes did not, however, greatly change the locus of control.

In 1940, as a result of Finnish war experience the People's Commissariat for Military and Naval Affairs was reorganized into the People's Commissariat for Defense (*Narkomoborony*) and a number of its subordinate directorates were reorganized. The PVO Directorate became the Main PVO Directorate (*Glavnoye upravlenoye PVO--GU PVO*) but the GU PVO still did not have operational control over the PVO forces in the military districts, although it apparently took over some administrative and support functions from the *Narkomoborony*. Its functions were limited to planning, providing arms and ensuring combat readiness.[14]

In February 1941 more changes were made, creating PVO zones coincident with military district borders and commanded by military district officers. The PVO zones were again headed by an assistant to the military district commander and in large zones with many units an intermediate brigade-level command was established to control the scattered resources. This reorganization thus arranged the PVO on a territorial basis and maintained its subordination to the military district. Deployment of forces between zones and assigning of priorities was done by the General

14 Svetlishin (1979a; 14-16), Batitskiy (1972; 15).

Staff, not the GU PVO. The PVO forces in the zones themselves would be controlled by the military districts and would become operational formations (*ob'yedineniy*) in wartime. Furthermore, the AAA of ground force units was not under the control of the military district Chief for PVO, as they were an integral part of the combined arms army units.[15] This system of control was maintained until after the outbreak of war.

The PVO zones were themselves differentiated by their proximity to the front. A strip varying in width from 200 to 600 km was designated a threatened zone, in which targets were attainable by German aviation. Most of the PVO assets were concentrated in the PVO zones within the threatened zone.[16] Particular attention was also given to the major administrative and industrial centers of Leningrad, Moscow and Baku where large forces were concentrated and where IA designated for PVO use was directly subordinate to the Chief of PVO for the military district.[17]

This organizational structure played an important role not only in the VPVO's history, but also in its historiography. The mixed subordination of forces and the absence of centralized national-level control has been criticized by almost all authors discussing the development of the VPVO. Furthermore, these questions of control took on great immediacy in the late 1970s and early 1980s when the VPVO organizational structure was changed to resemble that of the early 1940s. As the following section also shows, the deficiencies of the military district based organizational

15 Batitskiy (1968; 47-48), Svetlishin (1979a; 14-16), Batitskiy (1972; 15).

16 Batitskiy (1972a; 14), Svetlishin (1979a; 18-19).

17 Svetlishin (1979a; 18-19), Yerofeyev (1973b; 59).

structure were many, from the VPVO's perspective, and had a definite affect on the effectiveness of PVO in the first few months of the war.

3.3 The Great Patriotic War: 1941-1945

During the Great Patriotic War the organizational structure of the VPVO underwent a number of changes in response to the changing situation at the front and the various inefficiencies of the existing structure. These changes illustrate the importance attached by the Soviet military to perfecting organizational structures in order to increase effectiveness and also indicate a number of difficulties in organizing air defense that continue to this day. Thus, we must study these changes not only for their intrinsic interest but also for what they reveal about current PVO issues, and the VPVO's interpretation of these issues. The history of the Great Patriotic War both provides the empirical data for the study of problems of PVO and provides a medium (historiography of the Great Patriotic War) for discussing them.

As we have seen, changes in the structure of the VPVO continued until February 1941 but when the war came in June both the organizational structure and PVO forces proved inadequate. The German surprise attack of June 22, 1941 caught the PVO unprepared. Not only were large numbers of aircraft destroyed on the airfields but AAA forces had not been put on full combat alert and in some cases were located in camps far from their wartime deployment areas.[18] (German sources claim 1,811 Soviet aircraft destroyed on the first day, and over 4000 by the end of the first week,

18 Koldunov (1984b; 18-19) presents a fairly negative picture of the state of combat readiness of VPVO forces at the beginning of the war, while Batitskiy (1968; 67) presents a more sanguine picture.

while Soviet sources usually admit to a total loss of 1200 aircraft.[19] Those aircraft that remained were largely outdated and the ground force AAA units were greatly understrength. Furthermore, in the chaos of the first days and weeks of the war many AAA units found themselves engaged in anti-tank battles (since their guns turned out to be highly effective in the anti-tank role) while IA designated for PVO missions was often pre-empted for close air support (CAS) of retreating troops.[20] The forces available to the VPVOS are listed in Table 3.1.

With the beginning of the war the military districts were subsumed into fronts but the rapid retreat of Soviet forces upset the pre-war PVO plans as the objectives to be defended were overrun by the German ground offensive. The few PVO forces that remained were used in bits and pieces with little effect. As a result, a new series of organizational changes were instituted by the Supreme High Command (VGK).

The initial changes took part in the ground force AAA units, as they were amalgamated in an attempt to increase their concentration and effectiveness but losses due to enemy action had already resulted in a situation where little could be done to make the AAA an effective force.[21] PVO forces of the military districts had been included in Front formations and

19 For the German figures see Hardesty (1982; 15). The Soviet figure is given in Lavrent'yev (1972; 25).

20 For information on Soviet aircraft and AAA types see Batitskiy (1968; 33-41). Desnitskiy (1959; 39-41) presents a good discussion of some of the difficulties of the first few weeks of the war with particular reference to the buildup of the Moscow PVO force. Batitskiy (1968; 67-96) presents lots of war stories, including AAA anti-tank engagements, while Tur (1962; 16-19) and Lavrent'yev (1972; 25-27) critique both AAA force levels and the general organization of PVO at the beginning of the war. Svetlishin (1979a; 25) reprints part of the directive transferring AAA to anti-tank units.

21 Tur (1962; 17-18).

were used to screen lines of communication (LOCs--railroads, bridges, roads, pipelines) as well as for direct air and ground defense. But this use of the PVO forces did not allow them to carry out the primary mission of defending cities and other major objectives.[22]

As the front moved eastwards, an air threat to Moscow began to emerge, prompting the State Defense Committee (*Gosudarstvenniy Komitet Oborony*--GKO) to issue a decree on July 9 calling for the strengthening of the Moscow PVO. As a result of this PVO defenses were concentrated around Moscow creating a dense, echeloned, circular defense around the city.[23] Indeed, the problem of air defense appears to have been of great concern to the top Soviet leadership, and particularly to Stalin. At his meeting with Harry Hopkins in late July 1941 to discuss lend-lease supplies the first thing Stalin requested was 20,000 pieces of anti-aircraft artillery.[24] Stalin had also personally overseen one of the first major exercises of the Moscow PVO on July 21, 1941 just one day before the first German attack on Moscow.[25]

German air attacks on Moscow began on July 22 and continued until early spring, although the bulk of the attack took place in the fall. The air battle over Moscow occupies a place in Soviet air defense history similar to that of the Battle of Britain in British military history. It is presented as a classic example of successful PVO, preventing the

22 Svetlishin (1979a; 27).

23 See Batitskiy (1968; 97-105) for a discussion of the decree and the forces deployed. For some more detailed figures of forces deployed and their control structure see Svetlishin (1979a; 39-51).

24 As quoted in Werth (1963; 281).

25 Konstantinov (1981a; 66-67).

destruction of Moscow and (by implication) the fall of the city.[26] While the interpretations of this battle will be examined in detail later, it must be noted here that while a dense and fairly successful air defense was created, the German attempts to destroy Moscow do not seem to have been pressed home as the *Luftwaffe* was primarily concerned with support of ground troops in the ground offensive rather than razing Moscow.

In November a major reorganization of PVO forces took place, a reorganization that set the stage for the emergence of the VPVO as a separate service. The dual subordination of AAA and IA forces had not proven effective and the State Defense Committee on November 9, 1941 unified and centralized the control of the PVO troops formerly under military district or front control. Thus was formed the *Voyska PVO strany* (VPVOS), the air defense troops of the nation. The VPVOS was to be headed by a Deputy People's Commissar for Defense, with a main staff and corresponding branches (e.g. AAA) and support services (e.g. VNOS). Thus the VPVOS was given operational control of all PVO forces, except for some left to the Fronts and the Leningrad PVO forces. Moscow and Leningrad corps regions were formed and PVO division regions replaced the other PVO zones, except for those in the Far East.[27] On November 24 the *Narkomoborony* published a directive listing the units to be subordinated to the VPVOS and which would remain subordinate to the ground forces, completing the first stage

26 The historical literature on the defense of Moscow is enormous, although much of it is repetitive and unimaginative. Some of the best and most detailed works are: Desnitskiy (1959), Batitskiy (1968; 97-127), Svetlishin (1979a; 51-64), Svetlishin (1966), Mikhaylenko (1979). A good Western discussion of the air war that describes both Soviet and German difficulties is Hardesty (1982) especially Chapter 3 on the battle for Moscow.

27 Svetlishin (1979a; 77-78).

of the reorganization.[28] This established a strict delineation between the PVO forces organic to the ground forces (troop PVO, or later PVO SV) and the VPVOS forces responsible for defending rear area targets such as LOCs and large administrative-industrial centers.[29] Although this delineation has at times been blurred and even erased, the separation of these two forces has had a major impact not only on the organizational structure of the modern VPVO but also on its operational art. As we shall see, the tension between air defense of strategic and tactical targets is one of the crucial aspects of the development of modern Soviet air defense.

While the VPVOS historical literature considers this reorganization a great occasion, the PVO SV literature highlights the negative aspects. The transfer of the majority of AAA forces to the VPVOS left the troops almost without any air defense, particularly given the lack of air cover.[30]

This reorganization did not solve all of the VPVOS's control problems. While IA was formally designated for and subordinate to the VPVOS, it still remained within the Air Force system, relying upon their service and maintenance units. Major inter-service conflicts arose between the VPVOS and Air Force leadership over the support and missions of these aircraft.[31] As a result in January 1942, fighter aviation designated for PVO was transferred from the Air Force to the PVO, in essence becoming a

28 Batitskiy (1968; 125-6).

29 The term PVO SV will be used throughout to designate the Ground Forces air defense component, although the PVO SV was only formally created as a Ground Forces branch in 1958.

30 Tur (1962; 17-18).

31 Svetlishin (1973a; 97-98), Chedleyev (1977; 82).

branch of the PVO. By the beginning of 1942 the VPVOS had taken on the characteristics of an independent service, as is usually noted by Soviet authors.[32]

During 1942 there were no further major changes in the VPVOS organizational structure, although the Moscow corps region was reformed into the Moscow PVO front, while the Leningrad and Baku corps regions became PVO armies. This change allowed an expansion of officer and administrative staffs in order to better manage the growing PVO forces in these regions.[33] The PVO SV, however, was finally placed under the central control of the Commander of Artillery. Since the November 1941 reorganization PVO SV forces were distributed throughout the fronts and armies. All PVO SV units were now subordinate to the Commander of Artillery of and the post of Deputy Head of Artillery for PVO was created, with equivalent posts at the front and army levels. Army PVO regiments were also created, unifying some of the disparate PVO units, and increasing the concentration of fire. The new arrangement allowed for concentration and centralization of PVO SV forces and the creation of the first AAA Groups used to provide concentrated protection for Armies.[34] The PVO SV also began to receive more AAA as the industries relocated East of the Urals began to increase their production. IN particular, they began to receive the mid-calibre 85 mm gun which previously had only been distributed to the VPVOS.[35]

At Stalingrad VPVOS units were operationally subordinated to the Ground Forces Front, a temporary and local reversal of the independent

32 Svetlishin (1979a; 79).
33 Svetlishin (1979a; 81).
34 Tur (1962; 19).
35 Tur (1962; 19-20).

centralized control of the VPVOS.[36] On balance, though, the VPVOS retained and performed its missions (defense of cities, LOCs, concentration areas) and received more modern fighters and AAA that raised its effectiveness.[37]

By mid-1943 the need for yet another organizational change was felt. The catalyst was, ironically, the first German attempt to carry out strategic bombing in the deep rear of the nation. This was precisely the threat that the VPVOS was formed to counter and even by its own accounts the VPVOS did not perform well. By mid-summer 1943 German forces were preparing for the "Citadel" offensive at Kursk and the Luftwaffe launched attacks in early June against industrial targets in Saratov, Gor'kiy and Yaroslavl'. These attacks took the VPVOS in these regions by surprise and PVO performance was poor. Indeed, the attacks demonstrated a lack of coordination between PVO SV and the VPVOS, as well as poor coordination of IA and AAA forces in the targeted areas.[38]

As a result of the shortfalls in VPVOS performance, the Supreme High Command apparently concluded that the VPVOS was concentrating too much on the active front areas while neglecting deep rear areas. On June 29, 1943 it again decreed a major reorganization of the VPVOS. This reorganization attempted to solve the problem of controlling forces over large areas by splitting the VPVOS into two PVO fronts, one in the East and one in the West. (The Moscow PVO front was shortly afterward renamed the Moscow Special PVO Army, leaving only the two PVO fronts.)[39] PVO front commanders

36 Svetlishin (1979a; 99-100).
37 Svetlishin (1979a; 84-87).
38 Svetlishin (1979a; 134-137), Batitskiy (1968; 241-253).
39 Yerofeyev (1973b; 61).

would have a smaller number of forces to manage without giving up too much centralized control. At the same time, though, the VPVOS lost its previous position as a quasi-service. Rather than reporting directly to the Narkomoborony, the VPVOS was subordinated to the Commander of Artillery of the Soviet Army, as was the PVO SV. The position of Commander of the VPVOS was abolished, and the PVO front commanders apparently reported directly to the Commander of Artillery. A Central Staff apparatus and other administrations were retained under the VPVOS. Thus, the delineation between PVO SV and VPVOS that had been established in November 1941 was blurred. Both forces now reported to the Commander of Artillery, and the intent appears to have been to increase the coordination between the forces.[40] In fact, the two forces appear to have largely maintained their separate roles, with the Commander of Artillery's supervision of the VPVOS being only nominal. This demotion of the VPVOS plays an important role in the historiography of the VPVO, and as will be demonstrated later, the discussion over the wisdom of this action becomes a touchstone for contemporary arguments over the unification of VPVO and PVO SV forces.

After Kursk the Soviet Army moved to the offensive, posing new problems for the VPVOS. As the front moved westwards the problem of defending targets in the deep rear diminished, while the new problem of defending territory and cities liberated from the Germans arose. This also placed great demands on the VPVOS's ability to coordinate its actions with the PVO SV forces, for as Soviet troops entered an area the PVO SV would provide initial air defense but it would have to be relieved by the VPVOS so

40 Svetlishin (1979a; 149-150). For more detail on the Front commanders and their forces see Batitskiy (1968; 199-201).

as to accompany the advancing troops. If the relief were not carried out in a timely fashion either the troops would outrun their air defense and operate without protection, or the PVO SV would move forward while the VPVOS lagged behind, creating an undefended gap between the two PVO systems. In fact, both problems occurred. Part of the blame for this shortcoming was attributed to the VPVOS front organization: the West PVO front was overloaded and had few reserves while the East PVO front was almost dormant. Transfer of forces between the two fronts, however, was complicated by the very fact that they were separate, and apparently required the intervention of higher authorities. Furthermore, the VPVOS division and corps regions did not closely correspond to ground forces fronts, complicating the coordination between the VPVOS and the Ground Forces.[41]

To address these problems, the Supreme High Command again intervened to change the VPVOS's structure. In March-April 1944 the PVO front system was modified, creating Northern, Southern and Transcaucasus PVO fronts in place of the old East and West fronts.) This new structure allowed easier transfer of VPVOS units from the rear and reduced the number of active units controlled by each front. At the same time, PVO corps and division regions were transformed into actual corps and divisions. Where before the designation and control of forces was determined by the boundaries of the region, the new forces would retain their own designation and control structure as they moved forward, just like their counterparts in the Ground Forces. The corps and divisions were also realigned so as to prevent the overlap of PVO forces and Ground Forces, further improving coor-

41 Svetlishin (1979a; 178-180), Batitskiy (1968; 272-273).

dination. Finally, control of logistics was centralized and given to the VPVOS so that the PVO fronts no longer had to rely on the Ground Forces front logistics system.[42]

This reorganization appears to have worked out fairly well and there was no further tinkering with the VPVOS structure for another 8 months. In December 1944, due to the increasing width of the Soviet-German front and distance from Moscow, the North and South fronts were transformed into the West, South-West and Central PVO fronts, and the front commanders and their staffs were moved to more forward locations to facilitate command and control. The Central front was created to manage the defense of rear objectives, while the Transcaucasus front was left as before.[43] This proved to be the last reorganization of the war (with the minor exception of the mobilization of some PVO forces in the Far East), coming just a few months before its end.

3.4 Summary

In reviewing the history of the organizational structure in the Great Patriotic War several important points must be emphasized. First, while other services underwent reorganization during the war, the VPVOS's experience appears unique. The creation of the VPVOS as a quasi-service followed by its demotion to a branch of the artillery set the stage for its later reemergence as a separate service. Second, the distinction between air defense of troops (PVO SV) and administrative-political centers and the rear areas of fronts (VPVOS) was institutionalized early in the

42 Svetlishin (1979a; 179-180), Batitskiy (1968; 274).
43 Svetlishin (1979a; 190-191).

war and maintained throughout the war. This delineation of tasks is one of the basic features of the Soviet air defense system and has important operational consequences. Third, problems of interaction between VPVOS, PVO SV, the Ground Forces, and the Air Forces arose throughout the war and the organizational changes were attempts to resolve these problems and produce an efficient air defense system. To some extent these attempts succeeded, but as will be demonstrated later, inter-service and inter-branch coordination problems were never completely solved, and they form the antecedents for modern coordination problems.

While the development of VPVOS operational art will be examined in detail in a later chapter, it is worthwhile making a few general points here. Throughout the war there was a tendency to increasing the centralized control of VPVOS forces through the creation of larger formations, such as PVO fronts. At the same time, as modern radar and radio equipment was introduced (particularly in late 1943) the VPVOS began a slow transition from point defenses to area (zonal) defenses. This shift allowed more efficient use of VPVOS resources.[44]

It is also worth noting that the primary missions of the VPVOS shifted over time. At the beginning of the war, and particularly in late 1941, the primary task of the VPVOS was defense of large cities and lines of communications (LOCs) of troops. As the Soviets took the offensive the weight of the missions changed, and while administrative-political targets retained top priority, more and more of the VPVOS forces were committed to LOC defense and defense of the rear areas of Ground Forces fronts. Nonetheless, by the end of the war over half of the PVO forces were designated

44 Svetlishin (1979a; 248-250).

for the defense of large centers.[45] Indeed, Moscow, which for a long period of time was well out of reach of German attack had enormous VPVOS forces surrounding it at the end of the war, a concentration that has continued to the present.[46]

Throughout the development of the VPVOS in the Great Patriotic War the importance of efficient organization and command and control is stressed. This theme continues throughout the modern period as well, and in the late 1970s to early 1980s becomes a matter of prime importance, bearing on the mission definition of the VPVOS.

In the chapters that follow the post-war development of the VPVOS is examined, and throughout the influence of the Great Patriotic War experience is clear, both in surrogate arguments and as the formative experience that gave birth to VPVOS operational art and tactics.

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45 Svetlishin (1979a; 218-225).

46 Desnitskiy (1959; 53).

TABLE 3.1: Reported Effectiveness of PVO Forces

Operation	Kill Rate (%)	Pen. Rate (%)	Notes	Source
Moscow		<7	250 to city	Zimin (1961)
Moscow	9.9		Avg over 7/41-4/42	Desnitskiy (1959)
Moscow	4.7		7/41-10/41	Svetlishin (1966)
Moscow	3		7/41-8/41 (2222 sorties)	Svetlishin (1968)
Moscow	6.1	2	12,100 sorties, 250 pen	Anaymovich (1972)
Leningrad		86	Night flights	Zimin (1961)
Gor'kiy	5		1200 sorties	Svetlishin (1971)
Kursk	20		June 2: 800 ac	Zimin (1961)
Kursk (day 1)	12.4		315 sorties, PVO SV	Lavrent'yev (1978)
Kursk (day 3)	5		960 sorties	"
Kronstadt	20	58	>100 sorties	Smirnov (1978)
Kursk RR	38		170 sorties, 65 kills	Smirnov (1983)
Kursk RR	26.7		543 sorties, 145 kills	
V-1	52.8		Overall: 1944-45	Biryuzov (1961)
First Period	10		PVO SV, average	Lavrent'yev (1972)
GPW	2.4		304,157 sorties	Batitskiy (1972)
1973 War	0.5		25000 I sorties, 120 kills	Kozhevnikov (1984)

CHAPTER 4

THE POST-WAR YEARS AND THE VPVOS BUILDUP

4.1 Introduction

In the post-war years the VPVOS underwent a major buildup in forces and became the second-ranking Soviet military service. Facing a massive U.S. bomber force the Soviet reaction was to attempt to create a thick and effective defense that would blunt any U.S. attack and enable the USSR to win the war on the ground. But the decisions on the scope and nature of the air defense forces appear to have been largely based on inflated estimates of VPVOS effectiveness and so the seemingly "rational' response to the U.S. threat was influenced by organizational biases. Furthermore, this misestimation by the VPVOS had a significant influence on higher level considerations of strategy and doctrine. In this case all three levels of the Soviet defense decisionmaking structure appear to have been convinced of the need for a strong air defense. The VPVOS was able to successfully influence perceptions and decisions at higher levels in the decisionmaking structure. In this chapter the reasons behind the establishment and buildup of the VPVOS are examined, particularly the U.S. threat, the political and military doctrinal context, and perceptions of PVO effectiveness.

4.2 The First Post-War Period: 1945--1953

In the post-war years the issue of air defense took on great importance in Soviet defense policy. Development and deployment of large

calibre AAA and new radars was accelerated and jet aircraft were designed and built.[1] As with the rest of the armed services, in 1945-46 the VPVOS was reorganized and troop levels were reduced. But at the same time, the stature of the VPVOS began to increase and in February 1946 the position of Commander of VPVOS was created, subordinate to the Commander of Artillery of the Soviet Armed Forces.[2] While the re-establishment of this position went part way towards undoing the changes of June 1943, the VPVOS Commander was not a service chief.[3] This promotion would take place later in the 1940s as the threat increased still further.

4.2.1 The Threat

The USSR had never faced a major strategic bombing threat during the Great Patriotic War. While cities such as Stalingrad had been razed from the air these attacks were by short-range aviation and the targets were front-line cities. The interception of massive bomber attacks at long ranges and great depth was not a skill developed during these years. Yet at the end of the war the USSR faced just such a challenge. First, the U.S. had the atomic bomb, and for all the Soviet downplaying of its effectiveness the military leaders were aware of the new threat inherent in

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1 Batitskiy (1968; 343-48). Note that most of the other combatants had deployed large-calibre AAA during the war and the USSR was trying to catch up, although this is not mentioned in Soviet accounts. Furthermore, many of the radar gun-laying stations were apparently originally provided to the USSR by the U.S. under Lend-Lease programs.

2 At the same time the four PVO Fronts were transformed into PVO districts.

3 Batitskiy (1968; 340-341). Much of this material on the post-war development of the VPVOS may also be found in Dzhordzhadze and Shesterin (1972).

this weapon. Second, the USSR faced an opponent that had a massive strategic bombing force and extensive experience in its use. No longer would evacuating industry to East of the Urals work, for as the ranges of bombers and power of nuclear weapons increased no sanctuaries would remain.

In 1948 the U.S. stockpile of nuclear weapons was fairly small and war plans called for a combined nuclear and *conventional* attack on the USSR.[4] Indeed in 1948 there was only one wing of atomic-capable aircraft and approximately 50 atomic weapons.[5] Whether the Soviets had detailed knowledge of these forces and plans is unknown, but it is likely that they were able to estimate the U.S. stockpile and capabilities.[6]

There was another threat to the USSR, and a more immediate one: U.S. reconnaissance flights near and over Soviet territory. These flights served not only to infuriate Soviet leaders over the violation of their sovereignty but may also have triggered deep fears of surprise attack, for in the months before Barbarossa the Germans had also conducted extensive aerial reconnaissance.[7] Soviet air borders were quite porous and extensive, moderately deep, U.S. reconnaissance overflights of Soviet territory began in late 1950. On one day in 1950 SAC had 47 aircraft flying over Soviet airspace. While a few U.S. aircraft were lost, the Soviets seem to have been almost powerless to prevent these overflights.[8]

4 See Cave Brown (1978; 5-29) for an overview of U.S. war plans of the late 1940s.

5 See Kohn and Harahan (1988; 86).

6 Dinerstein (1962; 175) argues that the Soviets could have figured out the approximate size of the stockpile.

7 Werth (1964; 142).

8 Beschloss (1986; 77-78). Relatively shallow penetrations and border reconnaissance flights were apparently carried out before this. The type of aircraft used is not specified, but they were probably modified B-29 bombers (later RB-47 and RB-57) that would appear indistinguishable from

Finally, the outbreak of the Korean war also increased Soviet perceptions of the likelihood of war, and seems to have increased concern about air defense.

4.2.2 The VPVOS and Soviet Strategy

The Soviet response to the perceived U.S. threat was a fairly obvious one: to develop strategic defenses and to try to catch up in offensive striking forces. Most Western attention has been given to the latter: the Soviet efforts to develop the atomic bomb and to copy and mass-produce the B-29 bomber.[9] But at least as much effort was being put into defense against U.S. strategic forces and this emphasis was consistent with Soviet doctrine during this period.

Under Stalin, Soviet doctrine was strictly defined and could not be tampered with even by the professional military.[10] The basis of the doctrine was the distinction in military science between "permanently operating factors" that could influence the outcome of a war and "temporary operating factors" that only had short-term significance and could not decide the outcome of the war.[11] Surprise was considered a temporary opera-

(continued)

regular bombers to Soviet radar. Lemay tells of one mission when SAC flew all its reconnaissance aircraft over Vladivostok at high noon with only two MiG sightings and no interceptions. This may be the same incident Beschloss refers to, although Lemay does not fix the date other than "the 1950s." See Kohn and Harahan (1988; 86).

9 On Soviet bomber development see Monks (1977; 214-22), Kilmarx (1962; 250-62).

10 Garthoff (1962; 61-3).

11 Dinerstein (1962; 33). Some of the permanent factors were: stability of the rear, morale, quantity and quality of the armed forces, organizational abilities.

ting factor, and consistent with this it was argued that a surprise first blow, even with nuclear weapons, could not be decisive.[12] With such a view of surprise the creation of an air defense system to blunt a nuclear and conventional attack and to enable the country to function during the war made sense. If the first nuclear strike might not be decisive, multiple sorties with both conventional and nuclear weapons might be required, and the air defenses would be able to inflict significant attrition against the attackers.[13] Therefore, even if the PVO did not achieve extremely high attrition it might be able to exact a high enough penalty to greatly reduce the effectiveness of air attacks over time.[14] Indeed, Stalin appeared to be highly concerned about the danger of U.S. attack and Khrushchev reports that in the late 1940s Stalin ordered Moscow surrounded by 100 mm AAA at constant combat readiness.[15] Thus, not only was the creation of a strong PVO system consistent with, and even required by

12 Dinerstein (1962; 33-34).

13 Dinerstein also notes that U.S. bomber forces were dependent on bases close to the USSR, and if these could be overrun or destroyed then the U.S. strategic threat would be eliminated. Dinerstein (1962; 175-6).

14 This conclusion is supported by an analysis conducted by the Joint Chiefs of Staff in 1949 that showed very serious SAC losses of approximately 30% that would cripple it during an extended air campaign against the Soviet Union. By the early 1950s, however, when General LeMay took over SAC the level of proficiency of SAC had increased significantly and estimates of attrition decreased as new weapons and better training were incorporated. See Cave Brown (1978; 24-27).

15 Khrushchev (1974; 11, 533). According to Penkovskiy Stalin had Marshall of Artillery Yakovlev, former chief of the Main Artillery Directorate jailed for "having done a poor job of organizing the country's air defenses." Penkovksiy (1965; 317). Unfortunately Penkovskiy does not specify when this occurred, although Akhromeyev (1986; 844) lists Yakovlev in this post during the Great Patriotic War and from 1946-48 and there do not appear to be any "blank spots' or major setbacks in his career. If true it is a good reminder of both Stalin's stress on PVO and the dangers of not fulfilling his demands.

Soviet doctrine, but it seems to have had the backing of Stalin himself. Indeed, only with his support and intervention could the program of VPVOS armament and reorganization have taken place.

The turning point in VPVOS history came in 1948 when the VPVOS was again reorganized and finally became an independent service, although it was headed by a Commander, rather than Commander in Chief.[16] This move undid the reorganization of June 1943, essentially returning the VPVOS to its stature of January 1942. It did not, however, place the VPVOS at the same level as the other services, although it did indicate much greater prominence within the defense structure.

The mission of the VPVOS was fairly clear, if not very easy: to defend the Soviet homeland against air attack. This involved defense of both urban-industrial and military targets and VPVOS resources were spread fairly thinly.[17] The VPVOS began to receive new equipment, such as jet aircraft and new AAA, while surface-to-air missiles (SAMs) were developed. Indeed, during the early 1950s a major shift in aircraft strength from the Soviet Air Force to the VPVOS was noted by U.S. intelligence, suggesting

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16 A the same time Soviet territory was divided into a border area and internal territory. PVO of the border areas was controlled by the commander of the respective Military District, to whom all means of PVO in the district were subordinated. The Navy was given responsibility for defending its bases. The VPVOS apparently had primary responsibility for defense in the internal territory if the border areas were penetrated. See Dzhordzhadze and Shesterin (1972; 25), Batitskiy (1968; 349-350). It is interesting to note that this decision was made during the year that most Western historians consider the start of the Cold War.

17 See Curtis Lemay's (former Commander in Chief of SAC) comments in Kohn and Harahan (1988; 86-87). There is very little good numerical data on VPVOS forces during this time period, even from declassified sources. Most sources lump all fighters together without noting service designation or mission.

that priorities were changing in response to the U.S. challenges. Projections indicated that by 1954 the VPVOS would have over 3,500 fighter aircraft of which approximately 2900 would be jet interceptors.[18] But despite these increases in force size there were still real limitations on VPVOS capability, since IA forces had no nighttime or poor weather capability and while radar-controlled AAA was available it was unlikely to score high kill rates.[19]

VPVOS operational art also was developed, focusing on defense of industrial economic centers using massive Fighter Aviation (IA) and AAA forces on their approaches. From World War II a number of conclusions were drawn. Point defense was recognized as ineffective and the theory of the anti-air operation was developed. The anti-air operation was elaborated and named in 1953, becoming a fundamental part of training and operational art. The anti-air operation was to incorporate all branches, and even other services, coordinating their actions over a wide expanse of space and through a number of separate or linked battles. It also required great attention to the concentration of force and the timely creation and use of reserves as critical components of the operation.[20]

During this period the Korean war gave the Soviets a chance to test some of their new equipment, particularly radar-controlled AAA and the new MiG jet fighters, both of which proved quite effective.[21] Tactics were

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18 Young (1952; 3, Table IV). I am indebted to Jeff Sands for providing access to his declassified materials for this research.

19 Dinerstein (1962; 179).

20 Dzhordzhadze and Shesterin (1972; 26-28), Batitskiy (1968; 353-357).

21 Krasnov and Korzun (1972; 88-89), Orlov (1977), Babich (1987; 62-64). Some of the subsequent effectiveness inflation may have been due to the very good performance of the MiGs against U.S. B-29 bombers during the early part of the war. However, these two aircraft were not of the same technological level, and extrapolating from the Korean experience to jet bombers would have been misleading.

also developed during this period that formed the basis for VPVOS tactics through to the mid-1960s. The Korean War experience appears to have justified Soviet interest in dense air defenses.

Finally, even after the 1948 upgrading to a service tinkering with the VPVOS organizational structure continued. U.S. reconnaissance overflights became so serious in 1951 that Soviet sources claim the incursions precipitated a reorganization that established a frontier air defense system in the border military districts, consisting of IA, warning (VNOS) and support units.[22] This organization was designed to concentrate control of PVO forces in the districts that were being overflown, but according to Soviet sources it also complicated control arrangements and hampered leadership, as it spread responsibility for air defense between the Soviet Air Force, the Ground Forces (AAA), and the VPVOS. In 1953 the border air defense regions were united with the VPVOS, resulting in a unified and centralized nationwide air defense system.[23]

Thus, during this first post-war period the VPVOS went through a number of reorganizations and in the process was established as a service, although not on a par with the other services. The U.S. threat, forcibly brought home by penetration of Soviet airspace by reconnaissance aircraft, was increasing, while the U.S. stockpile grew and new jet bombers came into the U.S. inventory. Under such circumstances Soviet interest in PVO

22 But apparently excluding AAA forces which remained in the Ground Forces or under military district control. The border defense system was headed by K. A. Vershinin, who was a deputy commander of the Air Force, not the VPVOS.

23 Batitskiy (1968; 352), Dzhordzhadze and Shesterin (1972; 25).

is understandable. Furthermore, as considered in more detail below, the development of new PVO technologies held out hope for great increases in PVO effectiveness compared to past wars.

4.3 Building a Modern Air Defense System: 1954-60

After 1953 the VPVOS's place in the Soviet defense structure and its role in Soviet military strategy increased greatly. The first indication of this growing prominence was the creation in May 1954 of the position of Commander in Chief of the VPVOS (who was also a Deputy Minister of Defense) and the VPVOS joined the ranks of the other services, placing second to the Ground Forces in the protocol listing.[24] This new position indicated the high priority being given to development of strategic defenses.

4.3.1 The VPVOS and the Revolution in Military Affairs

After Stalin's death in 1953 Stalinist military science underwent a reappraisal leading to changes in Soviet military doctrine stressing the revolutionary nature of new combat technologies. The name given to this new era in warfare was the "Revolution in Military Affairs." The Revolution in Military Affairs was far from clear of political implications, though for Khrushchev was its main proponent and the Revolution played a critical role in his approach to defense and foreign policy.[25]

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24 Yakimanskiy (1973; 44).

25 The most detailed accounts of the revolution in military affairs and its impact on Soviet policy may be found in Dinerstein (1962), Wolfe (1964), Wolfe (1970), Garthoff (1962).

The Revolution in Military Affairs emphasized nuclear weapons and missiles over the traditional ground and naval forces and posited that a new world war would be nuclear from the start. Hence the emphasis in arms shifted from conventional forces to nuclear forces. In keeping with this Khrushchev made major cuts in Ground Forces personnel in 1955-7, 1958-9, and a partial cut in 1960.[26]

Along with this new nuclear emphasis came increased concern over the impact of surprise attack. In late 1953, Soviet authors began to reconsider the proposition that surprise was only a temporary operating factor and some suggested that nuclear weapons might increase the significance of this factor in a future war.[27] This increased stress on the role of surprise acted to increase the importance of air defense, for a surprise nuclear attack could conceivably be decisive in a future war if not countered.

While Western analysts tend to discuss Soviet plans in terms of a Soviet first strike, the Soviets were concerned about the possibility of a U.S. first strike.[28] For this reason the VPVOS was to be in a state of constant combat readiness and it assumed a strategic importance as the first line of defense against possible U.S. aggression. The second role of the VPVOS would be to provide a defense against remaining U.S. forces in case of a Soviet first strike.[29] But while this may have made sense in the mid-1950s when most U.S. nuclear forces were deployed near Soviet bor-

26 Wolfe (1970; 164-6).
27 Dinerstein (1962; 180-87).
28 There were good reasons for this. See Rosenberg (1981-2; 27, *passim*).
29 Wolfe (1964; 189-96).

ders and within range of Soviet theater forces, by the end of the 1950s the advent of the B-52 bomber allowed U.S. forces to be rebased in the U.S. At the time the Soviets had no means of carrying out a first strike against these targets despite Khrushchev's boasts about producing ICBMs like sausages.

For much of this period the VPVOS would have had to fend off a major U.S. strike, whether first or second. To do this required a further buildup and modernization of VPVOS capabilities. Indeed, the increased concern over surprise attack heightened the importance of the VPVOS and placed greater demands upon it. Now the VPVOS would not only have to blunt a mixed nuclear and conventional attack over time, but instead would have to repel a major nuclear attack. This demanded much higher effectiveness against incoming bombers

The development of the VPVOS was therefore very consistent with Soviet military doctrine as it developed during the 1950s under Khrushchev's tutelage. But in addition to military considerations there were also political considerations.

The decision to promote the VPVOS to the status of a full service must have been approved by the Politburo itself, as such a move was very rare and resulted in the creation of a new Deputy Minister of Defense position. But the timing of the upgrading is itself interesting, as it followed a major defeat for Malenkov over foreign policy. As Dinerstein has shown, in March and April of 1954 Malenkov was forced to back down on his claims that a future nuclear war would result in the destruction of world civilization.[30] In contrast, Malenkov was forced to espouse the

30 Dinerstein (1962; 69-77).

view propounded by Khrushchev and his allies, that a nuclear war would mean the collapse of *capitalism*, but not of socialism.[31] By the end of 1954 Malenkov had been removed from power, with this battle one of the defeats that resulted in his downfall.[32] In view of this it does not appear that the upgrading of the VPVOS in May of that year is a coincidence.[33] It is likely that one major component of the debate was whether strategic defense was feasible, or whether political accommodation and detente was a more reliable means of ensuring Soviet security.[34] In this case the winning of the debate by the Khrushchev faction gave rise to the decision to upgrade the VPVOS to a service and assign it high priority. Furthermore, throughout the 1950s the VPVOS appears to have

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31 Dinerstein (1962; 74-76).

32 See Medvedev and Medvedev (1978; 54). Malenkov was removed from power in 1954 but his resignation as Chairman of the Council of Ministers was not announced until February 1955.

33 Interestingly, less than two years earlier the VPVOS had been intimately involved with the downfall of another political figure: Beria. The actual arrest of Beria in July 1953 was carried out by the top officers of the Moscow PVO district (then commanded by K.S. Moskalenko), under the direction of Marshal Zhukov. Apparently the Moscow Garrison and Kremlin guard were not trusted enough to perform this task. For a remarkable eye-witness account of the arrest and the PVO's role in it see Bystrov (1988a,b,c).
While it is tempting to speculate that this duty rendered was repaid with the creation of a service, there is no good reason to believe it. First, the new Commander in Chief was not one of the officers participating in the arrest (nor was his successor). Second, such a *quid pro quo* seems quite out of keeping with the arrangement of the project and the relative power of the VPVO and the Party: the Party does not have to "request favors" from the services. Third, it is highly unlikely that defense decisions are made on such highly irrational grounds. Fourth, the top officers involved seem to have been acting for personal reasons, rather than out of any service loyalty.

34 Most sources cast this argument as one over foreign policy in its broadest sense. My comments here do not deny it, but I do suggest that the more concrete topic of resource allocation and priority for strategic defense may have been a major part of the debate.

been given high priority in resources and Khrushchev himself seems to have been a leading advocate of air defense.

Khrushchev's personal role in directing Soviet defense policy was very great, and his views were reflected in the developing Soviet force structure. Thus, Khrushchev's strong belief in the superiority of rockets over aircraft led to a strong emphasis on the production of ICBMs and SAMs.[35] Indeed, Khrushchev had some very clear ideas concerning the effectiveness of air defenses: in several places in his memoirs Khrushchev alludes to very high effectiveness and at one point clearly states that SAMs were expected to have very high effectiveness and that the results of Vietnam and the Middle East were extremely disappointing.[36] Khrushchev also appears to have strongly supported the buildup of VPVOS forces, at one point noting that such defenses had much greater priority than naval forces.[37]

One reason for this continuing concern with the VPVOS was the U-2 overflights beginning in 1956 that penetrated even deeper into Soviet territory than previous reconnaissance missions.[38] Khrushchev convincingly recounts his sense of outrage and indignation at the U.S. overflights and Soviet "impotence" in the early years.[39] While such emotional responses

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35 So strong was the stress on rockets that proponents of traditional aircraft had to resell them as "rocket-carriers." Thus, VPVOS fighter-interceptors became (air-to-air) rocket-carriers.

36 Khrushchev (1974; 41, 43-44, 51,). Estimates of very high PVO effectiveness was one of the reasons why the Soviet intercontinental bomber program never received strong backing.

37 Khrushchev (1972; 26, 35).

38 Beschloss (1986; 119-23). The first flight was over two of the most important and heavily defended objectives in the USSR--Moscow and Leningrad.

39 Khrushchev (1972; 448-9). More many other sections of his memoirs, this section rings true.

were not the primary reason for the priority given to the VPVOS it seems highly likely that these continual reminders of U.S. capability and Soviet ineffectiveness goaded the Soviets into increased attention to the air defense problem. All the more so, since if U-2s could operate with impunity then U.S. bombers might also operate without heavy losses.[40]

The VPVOS was thus considered an essential part of Soviet strategy: the strategic defense to complement the (delayed and limited) strategic offensive capabilities. The priority given the service with its promotion to second place (before the Air Force and Navy) plus the support evinced by Khrushchev are clear indications that the top leadership considered this mission of great importance and was willing to support its continued modernization during a period of overall reductions in troop manpower. Given the U.S. strategic bomber threat and the continued overflights such a high priority seems a sensible and rational policy. However, as will be demonstrated below, this rational decision was based on estimates of VPVOS effectiveness that were distorted by organizational perspectives. Before passing such a judgment we need to examine the forces created by the VPVOS and to estimate their real and perceived effectiveness.

4.3.2 VPVOS Force Structure

40 Soviet paranoia should not be underestimated in this case. Even though the U-2 was strictly a reconnaissance aircraft it would not have been impossible to modify it for bombing missions with nuclear weapons. Given Soviet concern over surprise attack the specter of a lone nuclear-armed U-2 starting a war with a surprise attack on Moscow (and destroying Soviet command and control and leadership) must have given the VPVOS nightmares.

During this period the VPVOS underwent a rapid expansion.[41] Interceptor aviation was modernized although through the mid 1950s it still lacked all-weather capability.[42] Total IA forces by the end of the decade numbered approximately 4000 aircraft, most of which were the newest and most sophisticated produced by the Soviet aircraft industry.[43]

A simultaneous buildup was conducted in the area of SAMs. Immediately after the war the Soviets had initiated work on SAMs, with the benefit of captured German documents, equipment and personnel.[44] This program resulted in the SA-1 SAM, 3,200 of which were deployed in two concentric circles around Moscow starting in 1954. This missile remained deployed until the early 1980s, when replacement with SA-10 SAMs began.[45] Later in the 1950s a more capable missile, the SA-2 was developed for high altitude air defense, scoring a notable victory in shooting down Gary Powers's U-2. Eventually up to 4600 SA-2s were deployed by the mid-1970s, although since then their number has gradually been reduced.[46] (See Figure 5.1.) In recognition of their growing role the SAM Troops (*Zenitnyy*

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41 Lee (1959; 125).

42 IA was based primarily on the MiG-15 and MiG-17 jet fighters in the early 1950s. These aircraft possessed good maneuverability and overall performance compared to Western aircraft but lacked an all-weather or night capability as they had no radar. See Lee (1959; 122-123). They were replaced in the mid to late 1950s by the supersonic MiG-19 and for all-weather use the Yak-25 was developed. Towards the end of the decade new fighters, such as the MiG-21, new Sukhoi (the Su-9/11) interceptors and the successor to the Yak-25, the Yak-28 were also being developed. See Green (1959; 143-145), Kilmarx (1963; 262-265).

43 Kilmarx (1963; 266-267).

44 Stockwell (1959; 239).

45 Wright (1986; 543-546) provides a good summary of the data on this missile.

46 Wright (1986; 547-555).

Raketnyy Voysk--Zenith Rocket Troops, ZRV) were incorporated in 1956 as the leading branch of the VPVOS.[47] Despite the advent of SAMs the VPVOS maintained approximately 10,000 large-calibre AAA pieces through the late 1950s.[48]

At the end of the war Soviet radar technology lagged that of the West but through strong indigenous efforts, (aided by captured German equipment and US lend-lease radars), they soon acquired a significant radar capability.[49] The Soviets attempted to develop and deploy a reliable radar system covering all likely enemy approach routes. The Warsaw Pact nations were added to the VPVOS warning system, extending its boundary far to the west.[50] During this period the Radiotechnical troops (RTV) were formed from the old VNOS branch.[51]

By the end of the 1950s the VPVOS had taken on the basic form and structure that continued through the late 1970s. A large interceptor force, backed by a strong SAM force for point defense and an extensive radar network. The size of the commitment to the development of the VPVOS is reflected in the total manpower of approximately 500,000, second only to the army.[52]

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47 Soviet sources do not give an exact date for the formation of the SAM Troops but the first Commander of the Moscow Air Defense District SAM forces was appointed in 1956, suggesting the formation of the branch in that year. See Konstantinov (1981; 192).

48 Batitskiy (1968; 358-359), Lee (1959; 125).

49 Lee (1959; 121-3, 126-7) and Stockwell (1959) emphasize the importance of German technology. Batitskiy (1968; 365-366) of course emphasizes Soviet contributions. A comprehensive discussion of Soviet radar development may be found in Lobanov (1982). For pre-war work on radar see Erickson (1972).

50 Kilmarx (1963; 267).

51 Batitskiy (1968; 365).

52 Jones (1977; 40).

The organizational structure of the VPVOS also was finalized during the 1950s, and remained stable through 1980. This structure emphasized centralized control of all VPVOS forces. While the exact details of the VPVOS organization are not very clear, most authors agree that there were a total of 16 air defense districts, 6 in the Warsaw Pact, the two major air defense districts of Moscow and Baku, and 8 others that are not identified in the Soviet or open Western literature.[53] Since the number of Air Defense Districts is less than the number of military districts, it is not likely that they share the same boundaries or that the military districts commanders had control over VPVOS forces.[54] Within the air

53 See Menaul (1980; 53), Jones (1978;80). Department of Defense (1981; 65). Jones points out that the Commander in Chief of the VPVOS was not publicly identified as the Commander of Warsaw Pact air defenses until April 1969. The six Warsaw Pact districts correspond to national boundaries rather than groups of forces. One may speculate on the locations of the other 8 Air Defense Districts in the Soviet Union. Obviously the Far East (Vladivostok) area and the Kola peninsula are likely locations. Leningrad may be included in a Kola Air Defense District, or may be separate (including the Baltic republics). A defensive system for the Western approaches to the Ukraine is also likely, perhaps based in Kiev. If Siberia is not included in the Far East area it may also have had a separate command. Other districts could augment the Baku Air Defense District's coverage in the Central Asian area, and perhaps cover the area between the Moscow Air Defense District and Western Siberia. Lee (1959; 125) suggests that there are 20 regional PVO commands "under an Army or Air Force General" spread over the USSR. This may again indicate a 1960s reorganization, or Lee may be referring to Aviation and Artillery officers (of the VPVOS) controlling the regions. It is also possible that Lee is referring to the structure existing before the reorganization of 1953. Lee lists the commands and their corresponding regions. In the North: Murmansk, Taimyr peninsula, Kolymsk peninsula, Kamchatka. Regional commands near Leningrad, Moscow, in the Crimea, Baku, Astrakhan, Omsk, Stalinabad, Alma Ata. In the Eastern areas: Ayan, Komsomolsk, and Vladivostok.

54 Garthoff (1959; 184) claims that during a war the PVO forces in the military districts would be controlled by the military district commander and staff. Furthermore, Garthoff (1959; 178) indicates that the Commander of IA PVO was simultaneously a Deputy Commander in Chief of the Air Force. It is possible that Garthoff was referring to the pre-1954 organization discussed above. Other authors agree that the VPVOS (before 1981) bypassed the military district command structure and exercised direct operational control over all PVO forces. See Scott and Scott (1981; 108-

defense districts the forces are organized into VPVOS armies (or possibly corps) composed of VPVOS divisions, regiments, and squadrons.[55]

Despite these immense efforts the efficacy of the system was open to doubt. Western analysts, viewing this massive air defense system tended to be skeptical of its effectiveness.[56] Indeed, Curtis Lemay, the Commander of SAC, has recently stated that during the 1950s SAC could have attacked the Soviet Union with almost no losses.[57] Documents from the

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109, 148). Lee (1959; 126) in the same book as Garthoff suggests this, although not very clearly or explicitly. If Garthoff's claims are correct, it appears that a further reorganization may have taken place in the 1960s, fully subordinating IA forces to the PVO and increasing centralized control.

Garthoff's claim is repeated in a 1980 work by Air Vice-Marshal Menaul, who asserts that IA forces are administratively subordinate to the Air Force, while they are operationally subordinate to the VPVOS. Menaul also asserts that VPVOS forces were directly controlled by the VPVOS headquarters, independent of military district control. Menaul (1980; 51,-53). Note, however, that Menaul refers to the subordination of IA PVO to the Soviet Air Force in the past tense, so it may have changed. Menaul also claims that AAA forces constitute a branch of the VPVOS, although other Western sources do not list them, and Soviet sources imply that they were superseded by the SAM troops. In short, the claims of Menaul and Garthoff do not seem to be sufficiently clear or well-documented to alter the description set out above. See Scott and Scott, cited above and Batitskiy (1968; 365).

55 Suvorov (1984; 78-80). Although some of Suvorov's statements on prewar organization appear to be incorrect, his description of organizational structure seems plausible. Suvorov also states that the Moscow and Baku Air Defense Districts would become PVO Fronts during wartime. Petersen (1979; 35) also notes that the air defense districts are really PVO armies.

56 For example, in 1963 Kilmarx concluded that "Russia has been unable to provide adequate defense against a large-scale attack by Strategic Air Command," and argued that the problems involved in creating an adequate defense were almost insurmountable. See Kilmarx (1963; 267). Lee, while noting the many deficiencies in VPVOS forces, was somewhat more optimistic noting that the VPVOS "could do well" against the U.S. and UK bomber forces but that it was unlikely to prevent the catastrophic destruction of the USSR. See Lee (1959; 129).

57 Kohn and Harahan (1988; 86-87). Lemay refers vaguely to attacking in the 1950s and is not specific on whether his comments apply to the entire decade but General Catton, another participant in the interview, asserts that this held true throughout the 1950s.

mid-1950s also indicate that SAC expected very low losses to Soviet air defenses.[58]

By the end of the 1950s we seem to have a paradox. The USSR had spent enormous amounts of money to develop an air defense system that most Western experts (and particularly SAC) considered ineffective. How are we to explain this paradox? Several factors appear to have been at work. First, the new military doctrine with its stress on nuclear war placed a premium on defense against nuclear attack. Second, there was a strong belief shared by both the civilian and military leadership that a highly effective air defense was possible. Third, leaving Soviet territory "undefended" would have been a politically, militarily, and psychologically difficult position to support. These factors, and especially the Soviet estimates of possible PVO effectiveness, contributed to an attitude that such a defense was both desirable and possible. Why did the Soviets consider the VPVOS highly effective and how did this perception contribute to the decisions concerning the VPVOS buildup?

It is in the area of estimating effectiveness that organizational biases and distortions appear to have been introduced into the decision-making process. Instead of basing estimates of effectiveness on realistic testing and exercises the VPVOS created an incentive structure that fostered the overestimation of effectiveness at all levels. This over-

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58 Rosenberg (1981-2; 24-5). Conversely, though, SAC estimated that the Soviets executing a first strike against the U.S. would suffer from 0-30% attrition due to U.S. air defenses. This suggests either a rather higher regard for the Air Defense Command or a higher degree of uncertainty in air defense effectiveness than usually acknowledged. See Rosenberg (1981-2; 26).

estimation, combined with Khrushchev's belief in the power of rockets (SAMs) appears to have resulted in both the military and civilian leadership far overestimating the effectiveness of the VPVOS. In World War II air defense systems achieved a 2% attrition rate, but the Soviet leadership seems to have expected an attrition rate of over 50%, more than a twenty-fold increase.[59] The reasons for this optimism are examined below.

4.3.3 Effectiveness Inflation

Military services are bureaucracies in the truest sense of the word, for if they are successful in deterring attack the services they provide will never be tested "in the market" and there will be little feedback to the organization concerning their effectiveness. During peacetime military services develop and field weapons based on their estimates of the enemy threat and their own estimates of weapons effectiveness. But these estimates are not wholly scientific, rational or objective. Instead, they are the product of (usually) educated guesses, preconceived notions, subjective opinions, selective history and potentially biased research and testing, leavened with a bit of data about real performance and the overall nature of the threat. Until a weapon is tested in combat, its real effectiveness is not known, and it is only through field testing and exercises that a rough pre-battle estimate of effectiveness can be determined. In the development of any weapon system there are bureaucratic and organizational factors that influence the assessment of weapons, and these are also to be expected in the case of the Soviet armed

59 Rosenberg (1981-82; 24), Hastings (1979; 413-14).

services. Furthermore, even if weapons are well tested before their combat use, the overall combat performance of the integrated forces against a capable enemy may differ substantially from that achieved on the test ranges. In the case of the VPVOS the problem was accentuated by the deployment of completely new and untested weapon systems based on new technologies.

While overestimation of weapons effectiveness may be found in many armed forces,[60] it may be particularly prevalent in the Soviet armed forces. The reasons for this may be found in both culture and organizational structure and incentives.

Soviet culture has always had a strong streak of technological optimism and utopianism. As in U.S. culture, there is often a tendency to look for a technological fix to problems, and to view new technology in the best possible light. This was particularly true in the late 1950s, early 1960s when Soviet technology was scoring a series of triumphs in space and even the U.S. was seriously concerned about losing its technological lead.

There are also important organizational factors at work in the assessment of weapons effectiveness. Detailed specifications for military systems are set out by the services (after program approval by the General Staff) and these specifications must be met by the design bureaus (OKBs).[61] The incentive structure at work here is somewhat different from

60 For example, Momyer (1978; 135-136) notes that some observers interpreted U.S. SAM exercises as proof that tactical aircraft couldn't penetrate SAM defenses.

61 Alexander (1978-9; 31-35).

that in the U.S., in that the design bureaus do not have to sell their products to the services. Certainly, if a design bureau does not have any of its work accepted by the services it will be disbanded or reassigned, but there is less competitiveness amongst the design bureaus than among U.S. defense contractors. Furthermore, there is a disincentive to high technology, state-of-the-art weapons, for these increase the design bureau's risk, and design bureau performance is judged on meeting the project milestones and output indicators.[62] Thus, there is likely to be some "technology pull" on the part of the services with the design bureaus attempting to moderate, and then meet, the demands upon them. While the military is ultimately responsible for the approval and acceptance of the weapon, the joint interests of the service and the design bureau may militate against a truly critical review of weapons performance.[63] The service may prefer to deploy a new system and work out the bugs in it during deployment, rather than delay deployment in the hopes of obtaining a perfect product.[64]

In the design and approval stages, then, there may be a tendency to aim for, and achieve, moderate to high performance goals. While the military representatives at factories enforce high manufacturing quality, less is known about weapons testing before they are accepted into the services. Both the design bureaus and the services appear to have incentives for

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62 Alexander (1978/79; 24, 29-35). For a good discussion of the role of designers and the defense industry in Soviet defense policy see Almquist (1987).

63 See Firdman (1985; 88-89) for an example of some of the distortions that may take place in the acceptance and review process.

64 Alexander (1978-9; 33-34).

maximizing the effectiveness of the weapons, and given the difficulty of testing weapons under conditions close to combat there may be a strong tendency to relax the testing conditions, leading to overestimates of effectiveness.[65]

Once weapons reach combat units a different set of incentives takes over. In operational units the incentive structure is very similar to that found in the Soviet economy as a whole. Unit performance is evaluated by a complex of output measures, and the unit itself is awarded the title of "outstanding", "good", "satisfactory" and "unsatisfactory".[66] The pressure is on unit commanders to achieve the highest level and to do this they have to achieve high output indicators.[67] Chief among these indicators is combat readiness and performance on exercises. VPVOS articles throughout the twenty year period stress the importance of exercises, particularly those involving live firing of SAMs.[68] But along with this emphasis on exercises there is continual criticism of "routine approaches",

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65 This is a common problem in U.S. weapons testing. For an extensive discussion see Stockfisch (1973; 202-244).

66 This system is implied in many articles. The four levels are mentioned explicitly in Chesnokov (1984; 27) in a discussion of AAA fire scoring. Note that the vast majority of units are in the "outstanding" or "good" categories. Koldunov (1971; 23) states that all of the units in the Baku air defense district are good or outstanding. Batitskiy (1972c; 8) notes that half of all personnel are "outstanding" while Bobylev (1978a; 6) points out that 95% of all personnel have a class rating (there are several classes indicating different skill levels) and 1/3 of all VPVOS troops were outstanding. The discrepancy between the latter two figures is unusual, as numbers of "outstanding" troops are usually quite stable. The Batitskiy number may have been inflated in honor of the Lenin jubilee. Also note that these numbers are couched in inaccurate terms ("every third troop" or "every third troop" so there may be substantial rounding error.

67 Good anecdotal reports on this stress on meeting the "norms" may be found in Suvorov (1988; 53-60, passim), and Belenko (1980; 83-85).

68 See, for example, Gurinov (1976; 34-36) and the Batitskiy articles listed above.

"stereotyped exercises", and oversimplification of training and exercises. The gist of these complaints is clear, and is sometimes made explicit: in order to achieve high output indicators commanders oversimplify their exercises so that their crews perform well and receive scores of "outstanding," thereby contributing to the overall high rating of the unit and of the commander.[69] Examples include having the target drone fly a straight line by the SAM launchers with no evasive action, and generally creating a situation much simpler than that expected in real combat.[70] This problem has been recognized by the high command of the VPVOS, but the continual flow of articles deploring routine and stereotyping suggests that the problem has not been eliminated and continues to be widespread.[71] This is due to its being "hardwired" into the basic incentive structure of the service. It cannot be any more easily eliminated by new slogans or campaigns than can the chronic "overfulfillment" of meaningless goals in the civilian economy.

While these dynamics may be present in the militaries of many countries, in the Soviet Union they are compounded by tight secrecy and compartmentalization, and the absence of any outside criticism of military

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69 See in particular Batitskiy's harsh criticism of "hollow indicators" in Batitskiy (1974; 5-6) and his warnings about "academic" training rather than realistic training in Batitskiy (1971; 12). Other criticisms along these lines may be found in Grishkov (1972; 4), Batitskiy (1975; 8).

70 For a recent example see Teteyev (1988; 1).

71 See Pavlov and Novoselov (1987), Yurasov (1985), Gorokhov (1983). It should be noted that this problem is endemic to the Soviet military, not just to the VPVOS. Nor, for that matter is it limited to the Soviet military, for many examples of this type of problem could be found throughout modern military history, such as the development of the "cult of the offensive" and the tardily-abandoned belief in the efficacy of obsolete weapons such as the horse cavalry and battleships.

performance. There are no Congressional committees to delve into the details of system performance, no protective laws for whistle-blowers, or investigative journalists hunting for a big story of military waste and fraud. Thus there are no checks or balances, and the military officers have no recourse to outside forums--they must play the game or leave the service altogether.

Given this incentive structure, one should expect a type of "effectiveness inflation" within the service. Basic, but high, standards are set by the upper levels and the units proceed to "fulfill" them superficially. Thus, the expectations of the high command may be met, generating over time a false impression of high effectiveness. In the absence of real combat to test both weapons and troops, estimates of effectiveness may increase over time based on both good-condition testing ground evaluations and the efforts of unit commanders to always fulfill their plans. If the high command was originally healthily skeptical of the effectiveness of their systems the good results coming up from below, combined with the need to defend the systems to the political leadership, may reinforce their belief in the effectiveness of the system. Even if the leadership does discount the data coming from the units, they still may tend to overestimate effectiveness and are deprived of any accurate information.

The VPVOS began the transition from AAA to SAMs, and all-weather interceptors in the late 1950s, early 1960s giving the forces an all-weather and almost all-altitude capability. In several articles by top-ranking VPVOS officers there is a strong implication that these new weapons and technologies would dramatically raise the effectiveness of the VPVOS.[72]

72 Biryuzov (1961), Zimin (1965), Batitskiy (1967c).

Gaps in the defense could now be filled: no longer would bombers have an easier ride at night or in bad weather than during the daytime.

This effectiveness inflation appears to have been particularly strong with the SAM Troops. Upon their formation the SAM Troops were acclaimed as the basic combat means of the VPVOS and was given pride of place in the VPVOS protocol ordering. SAMs held out hope for attaining an all-weather capability for the VPVOS and raising its effectiveness dramatically. The evidence suggests that during the early 1960s that the VPVOS had developed estimates of SAM effectiveness much higher than currently believed, perhaps on the order of 60-80% effectiveness per missile (SSPK=0.8 to 0.9).[73] The conversion of units to SAMs required extensive retraining and reequipping of old AAA units and high performance was expected as reflected in the newly developed stress on destroying the target with the "first rocket." While this slogan may appear to be superficial propaganda, it does capture the emphasis on high accuracy and effectiveness. One article pointed out that whereas AAA required thousands of rounds to hit a target, SAMs could destroy the target on the first shot.[74] VPVOS forces were routinely being touted as able to destroy all enemy aircraft and cruise missiles. While this is obviously an exaggeration, it corroborates other VPVOS comments on the need for an "impenetrable"

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73 The measure of effectiveness used here is the probability of hitting the target with one missile (SSPK--Single Shot Probability of Kill). While this is not the same as an overall attrition rate, a very high SSPK would imply a high overall attrition given that all penetrating targets were observed and there were sufficient missiles to fire at them. The evidence indicates that the Soviets believed that both of these conditions would be met.

74 Golikov (1966; 13).

defense against nuclear weapons and suggests pressure to achieve high, if misleading, levels of effectiveness.[75] Clearly, the system was expected to be highly effective, with the SAM Troops playing the main role.

Other indirect indications of SAM effectiveness also support the argument that very high accuracy was expected. Thus, Isby reports that the Yugoslavs upon buying SA-2s from the Soviets were advised that they were 80% effective.[76] A book published in 1960 by VPVOS authors also cited Western sources (without criticism) claiming that accuracies of up to 65% could be expected.[77]

These estimates of high SAM effectiveness were extended to estimates of overall air defense effectiveness, as indicated by several Soviet sources.

The views of the top VPVOS leadership seem to have reflected these estimates of high effectiveness, as indicated in a 1961 article by the Commander in Chief of the VPVOS, Marshal S.S. Biryuzov.[78] Biryuzov examined the history of strategic bombing and air defense during World War II and extracted several important air defense principles from the experience.[79] Of these great importance was attached to the development of radar and the attainment of an all-weather capability. In the past the

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75 Biryuzov (1961) and Zimin (1965).

76 Isby (1981; 247).

77 Ashkerov (1960; 95).

78 Marshal Biryuzov had headed the VPVOS since 1955 after the death of its first Commander in Chief, General Govorov. A commander of wide experience and close connections with Khrushchev, Biryuzov later went on to become Commander in Chief of the Strategic Rocket Forces (SRF), and subsequently Chief of the General Staff. See Akhromeyev (1986; 81), Wolfe (1964; 44).

79 Although this article appeared in 1961 it seems to reflect VPVOS thinking about air defense in the 1950s as well.

response of the offense to a strong PVO was to go to night attacks or bad weather attacks, for while these degraded the offense's accuracy they degraded that of the defense even more. With an all-weather defense capability, however, all means of avoidance would be sealed off--radar guided aircraft and SAMs would be able to intercept and destroy targets under all conditions.[80] Against this capability is ranged the possibility of enemy electronic countermeasures (ECM), but while Biryuzov notes this problem he does not attach an effectiveness to it.[81]

Nowhere does Biryuzov explicitly indicate the likely effectiveness of the overall VPVOS system, but he does provide some interesting hints. First, in a discussion of the U.K. defense against the V-1 cruise missile Biryuzov notes that the British achieved attrition rates of over 50%, indicating that defense against unpiloted vehicles may be ten times more effective than against piloted vehicles.[82] This indicates that Biryuzov was not impressed by the U.S. cruise missile program of the time.[83] Second, Biryuzov notes that with the appearance of nuclear weapons, "There arose the necessity of sharply increasing the effectiveness of PVO. Now one cannot be content with destroying 5-10% of the aircraft flying."[84] Biryuzov then stresses the need for an impenetrable PVO, but doesn't indicate how such a high effectiveness can be attained.

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80 Biryuzov (1961; 17-20).

81 Biryuzov (1961; 21-22).

82 Biryuzov (1961; 26).

83 For details on early cruise missile development see Werrell (1985; 79-134).

84 Biryuzov (1961; 26). It should be pointed out that such high attrition rates were rarely achieved in World War II, although some Soviet sources claim rates this high for certain air battles.

Thus, we see the Commander in Chief of the VPVOS implying that the VPVOS had to attain much greater effectiveness than during the previous war.[85] The new technology was assumed to produce this increase in defense effectiveness, and we may extrapolate that Biryuzov was expecting attrition rates closer to those achieved by the British against the V-1 against manned bombers, and even higher rates against cruise missiles and stand-off weapons.

These high estimates were reiterated, and even elaborated upon in articles by lower-ranking officers. One particularly explicit comment to this effect came in a review of a book on U.S. air defense systems, where the reviewer implied that a 20% overall effectiveness was insufficient for strategic air defense.[86] The only explicit estimate of PVO effectiveness against strategic bombers comes in 1967, in an article in which the author stresses the difficulty of penetrating tactical air defenses. After describing the air war in Vietnam the author notes that "As concerns strategic aviation, it is the opinion of the military leadership of the U.S.A. that less than 50% of the aircraft involved in a raid could penetrate through a modern air defense screen."[87] Unlike most of the other assertions in this article, though, no Western source is given for this figure, and it seems far higher than most Western estimates.

Confirming evidence of Soviet expectations of high PVO effectiveness come from Khrushchev himself. As noted above, in several places in his

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85 A similar argument was made several years later in *Military Thought* by the First Deputy Commander (FDC) of the VPVOS. See Zimin (1965).

86 Zabelok (1967; 94). Note that this figure for U.S. air defense effectiveness does not appear in the book being reviewed. (See Krysenko 1966).

87 Orlov (1967; 128).

memoirs he notes that Western air defenses were considered very strong, particularly in relation to the Soviet Tu-95 bomber.[88] As if to further the confidence in the effectiveness of SAMs, Khrushchev announced that Powers's U-2 was destroyed by the first SAM.[89] While this may have been Khrushchevian bluster this claim suggests both that such a feat was not incredible and that Khrushchev may have believed it himself.[90] The U-2 incident may have confirmed official belief in the high effectiveness of SAMs and the overall VPVOS system. Even if, as reported by Penkovskiy, fourteen missiles were required to destroy the U-2 this was a far better performance than previous air defense weapons. In addition, this success of the SA-2s prevented any further incursions by the U-2.[91]

Khrushchev also notes that "Subsequent evidence in Vietnam and the Middle East have shown us that perhaps we overestimated the effectiveness of surface-to-air missiles and underestimated the effectiveness of low altitude fighter-bombers."[92] Khrushchev then goes on to note that in the future the effectiveness of SAMs will be increased so as to destroy even low altitude penetrators. Thus, in addition to the implicit arguments of the military leaders, there is good evidence from the political leadership that the effectiveness of these weapons was overestimated.

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88 See Khrushchev (1974; 40-41, 43).

89 Penkovskiy claims that it required 14 SA-2s to destroy the U-2, and that in the process a Soviet MiG was also shot down. Penkovskiy (1965; 371-2).

90 Khrushchev (1972; 444-45) repeats this claim in his memoirs and while he may again be engaging in bluster his general attitude towards the new military technology suggests that he was likely to believe such a report.

91 Khrushchev (1972; 449).

92 Khrushchev (1974; 54).

All these data points, taken together, point towards the conclusion that the Soviet military and political leadership were convinced of the high effectiveness of SAMs and of the VPVOS system overall.[93] This misestimation was the result of organizational biases and incentive structures, coupled with technological optimism. It was one of the crucial factors in the decision to create a massive air defense system against nuclear attack, as examined below.

4.4 Overview: Decisionmaking and the VPVOS

Many factors went into the decision to create massive strategic air defenses during the 1950s: the U.S. bomber threat, outrage at U-2 overflights, political maneuvers and personal opinions, doctrinal change, and the inflated estimates of weapons effectiveness. How did all these factors come together and what does this tell us about the decisionmaking process?

First, there was a clear U.S. threat. The increasing U.S. stockpile and the doctrine of "massive retaliation" enunciated in January 1954 served notice that nuclear weapons were a key element in the U.S. arsenal and would be used in a major conflict.[94] While not a new concept, this emphasized the role of nuclear weapons in war planning. Simultaneously the continued probing and overflights of Soviet territory were a constant reminder to the Soviet leadership of U.S. capabilities.

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93 The only data relevant to IA performance suggests (from Western sources) that IA might be up to 35% effective, again a very high estimate. See Krysenko (1966; 170).

94 Freedman (1983; 81-88).

Second, the changes taking place in the Soviet political and military leadership, along with doctrinal changes, provided an opportunity to develop new forces and strategy. The increased recognition of the role of surprise and the need to blunt any U.S. nuclear attack both pointed in the direction of strategic defense. Furthermore, given the high effectiveness expected from the new generation of weapons there was hope for successfully carrying out such a defense.

Third, there were historical and institutional factors at work. The PVO structures that the Soviets had experimented with during the Great Patriotic War provided the basis for creating a new, independent service modeled after that existing in 1942. Conversely, there was no strategic bombing tradition--the efforts of Soviet long-range bombers during the Great Patriotic War had been relatively small and in the early period of the war they had suffered extremely high losses due to their obsolete aircraft.[95] Hence no powerful, experienced organization such as SAC existed to counterbalance the estimates of PVO effectiveness. Soviet Long Range Aviation was in fact limited in size due to the assumption that air defense systems had ended the effectiveness of bombers, as well as the technological difficulties encountered in building long-range strategic bombers.[96]

Thus, in 1954 a confluence of factors resulted in the creation of the VPVOS. The upgrading of the VPVOS to a full service was a clear recognition of its great importance within the overall context of Soviet

95 See Hardesty (192; 26-27, 85-86).
96 Khrushchev (1974; 39).

strategy. To a certain extent it appears to be a rational response to the threat presented by the U.S., and thus a good example of the rational actor--action/reaction model. Such an explanation misses, however, much of the richness that can be gained from a more detailed consideration of the factors examined above.

In this case there is a clear convergence of interests between all of the levels of the decisionmaking structure. The VPVOS, through its estimates of force effectiveness, appears to have convinced both the political leadership (level 1) and the military leadership (level 2) of the feasibility and desirability, indeed even the necessity of strategic air defense. Thus influence was exerted upon the decisionmaking process by the service indirectly, through effectiveness inflation, rather than by open advocacy. The internal characteristics and incentive structures of the service thus had a significant effect on levels much higher than operational art, even when the overall decision was based on the threat and other factors. This consensus between the various decisionmaking levels on the need for a strong air defense system appears to have held sway throughout the 1950s and into the early 1960s.

If the decision to create a massive PVO system was rational provided that one accepted the inflated effectiveness estimates: would different estimates have produced different outcomes? This question is, of course, impossible to answer authoritatively but we may speculate on what the "rational" decisionmaker might have done with more realistic estimates of VPVOS effectiveness. First, a major shift of resources into the area of strategic offensive forces, such as bombers, might have been an option. Such a shift would emphasize a more deterrent than defensive strategy, and

given the reduced estimate of air defense estimates would be rational.[97] Second, if air defenses were to be created a more modest, "warning" system might have been developed that stressed providing defense of air bases and strategic offensive assets, allowing offensive forces to be launched under attack. Third, a thick border defense to deal with overflights might have been created, with interior areas left less defended. Finally, without the great stress on SAMs by Khrushchev the actual force structure might have been significantly different, with a larger IA component or some other mix of forces.

In short, both organizational (effectiveness inflation), historical (lack of a strategic bombing tradition), and personal (Khrushchev's confidence in new technology) factors influenced the decisionmaking process. In the absence of the organizational influence of the VPVOS significantly different outcomes might have occurred, such as greater emphasis on strategic bombers. The decision actually made was not "irrational" but it was the product of a number of factors and considerations that are not well explained by a simple action-reaction or rational actor model. Here, the integrated model provides a richer and more detailed explanation of the VPVOS's creation and buildup.

As new technologies developed the VPVOS found its threats and eventually its missions changing in unexpected ways that took it further away from its original objectives. These developments are examined in the next chapter.

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97 This was the position argued by SAC--it was better to hit the Soviets first rather than spend money on ineffective air defenses. Freedman (1983; 127-34).

CHAPTER 5

THE VPVOS IN THE 1960s

5.1 Introduction

The 1960s saw the rise of a qualitatively new threat to the VPVOS: the ICBM. In addition, strategic bomber tactics and equipment changed and further complicated the work of the VPVOS. The response of the VPVOS to this changing threat, along with changing Soviet doctrine and strategy is examined in this chapter. In the area of operational art and weapons development the VPVOS exhibited many of the characteristics predicted by the organizational politics model: conservatism, incrementalism, and a tendency to interpret the developing threat in accord with its own perceptions. These traits led to the deployment of weapons optimized for threats that never materialized, and a slow adaptation to the newly developing threat of low-altitude penetration.

The VPVOS responded to the ICBM threat by developing and advocating the deployment of an anti-ballistic missile system. In this case, however, the issue of deployment involved several levels of the decisionmaking structure and engendered a great deal of controversy. Despite the advocacy attempts by the VPVOS the system was not deployed and negotiations with the U.S. eventually produced the ABM treaty.

While in some respects separate, the air and missile defense issues were quite closely coupled, for they formed the basis of the VPVOS's role

and mission definition. In the sections that follow the issues at stake and the decisionmaking process are examined in more detail.

5.2 The Changing Strategic Environment

Several factors, both internal and external, influenced the evolution of the VPVOS during the 1960s. In this section the changing environment and its impact on the VPVOS is examined.

5.2.1 The U.S. Threat

Having developed a massive PVO system in the 1950s, in the 1960s the VPVOS faced the prospect of a U.S. end-run around it with the Minuteman and Polaris missile forces. As the new missiles were deployed and older bombers were retired the proportion of the U.S. striking force on bombers began to decline.[1] It did not wither away, though, and neither did the VPVOS.

The U.S. bomber force, in response to Soviet development of SAMs and high altitude interceptors also changed its tactics, shifting to low altitude penetration during the late 1950s and early 1960s. In addition to this low altitude threat, SAC was pushing the development of the B-58 Hustler supersonic bomber and the even more advanced B-70 Valkyrie, a high speed (Mach 3) high altitude bomber intended to overfly and out-run Soviet air defenses.[2] Thus the VPVOS faced a multi-pronged threat: ICBMs, SLBMs, low altitude bomber attack, high altitude bomber attack, bomber launched

1 See Norris, Arkin and Cochran (1987).
2 Kotz (1988; 57).

air-to-surface missiles, some primitive cruise missiles, nuclear-capable carrier aircraft and tactical fighter-bombers in Europe.[3]

The VPVOS did have one success to its credit: reconnaissance overflights of the Soviet Union had ceased because the U.S. now considered the U-2 vulnerable. But this advantage was partly offset by the advent of reconnaissance satellites, a development that was initially condemned by the USSR but later accepted.[4] The military use of space did become a concern of the VPVOS later in the decade as the anti-satellite (*protivokosmicheskaya oborona*--PKO) mission was developed by the VPVOS.[5]

5.2.2 Changing Doctrine and Leadership

While the 1960s started with the revolution in military affairs in full swing, by the end of the decade Soviet doctrine had swung back to a more balanced position between nuclear and conventional warfare. This shift was partly in response to NATO's 1967 adoption of the strategy of flexible response, but to an even greater extent it reflected internal Soviet considerations.

The late 1950s-early 1960s saw a great emphasis on nuclear weapons, with the creation at the end of 1959 of the Strategic Rocket Forces (SRF) as the premier Soviet service, ranking above the ground forces. The SRF was entrusted with the development and deployment of Soviet ICBMs and IRBMs (intermediate-range ballistic missiles). This move reflected both

3 On the U.S. efforts to develop cruise missiles and air-to-surface missiles see Werrell (1985; Chapter IV). A critical view of the B-70 is presented in Enthoven and Smith (1971; 243-251).

4 Beschloss (1986; 392-93).

5 Freedman (1977).

Khrushchev's emphasis on missiles and nuclear weapons and his penchant for showmanship, for despite the creation of the service it was not until the mid-1960s that the USSR developed a significant ICBM force.

The removal of Khrushchev in October 1964 also removed the chief proponent of the revolution in military affairs and ushered in an era where the military would have greater say in its own affairs with less meddling in them by reform-minded civilians.[6]

Beginning in the mid to late 1960s the Soviets began to reappraise the primacy of nuclear weapons and began to assign a greater role to conventional weapons and the more traditional military services such as the ground forces. The ground forces high command, which had been dissolved by Khrushchev in 1964 was reinstated in 1967, and the former Chief of the General Staff M. V. Zakharov, whom Khrushchev had replaced for his resistance to the new views, was reappointed to the position after Biryuzov's death in October 1964.[7]

The Brezhnev policy of "stability of cadres" was to have significant effects on the military, increasing the length of service of the top officers and eliminating Khrushchev's habit of swapping officers amongst services. This resulted in an environment of greater stability for all levels of the military leadership and in combination with the return of prestige and authority to the military it seems to have set the stage for the further development of, and debates over, military science and weapons development.

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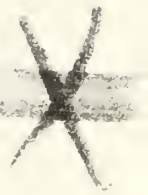
6 See Meyer (1985), Warner (1977; 98-100).

7 Warner (1977; 99-100), Akhromeyev (1986; 721).

Before its cadres stabilized the VPVOS went through several personnel shuffles. While these changes do not appear to have caused major changes in VPVOS operational art or force structure they do seem to have been intertwined with the debate over VPVOS performance and the project to develop an effective anti-missile defense (*protivoraketnaya oborona*--PRO).



The first change was the transfer of Marshal Biryuzov from his position of Commander in Chief VPVOS to Commander in Chief SRF in April 1962, some months before the Cuban Missile Crisis.[8] Biryuzov appears to have been entrusted with the emplacement of the missiles in Cuba, and despite the failure of that gamble in March 1963 he was appointed Chief of the General Staff.[9] Biryuzov retained this post until his death on October 19, 1964 in a plane crash in Yugoslavia just 5 days after Khrushchev's ouster.[10] During his tenure at the VPVOS Biryuzov appears to have developed a close relationship with Khrushchev that may also have helped the institutional fortunes of the VPVOS during the 1950s and early 1960s. Furthermore, Biryuzov may have remained sympathetic to the VPVOS's goals even after becoming Chief of the General Staff.

Marshal Sudets replaced Biryuzov as Commander in Chief VPVOS in April 1962. Sudets was an unlikely candidate to head the VPVOS, for although he was a career aviation officer, Sudets's assignments had primari-

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8 Scott and Scott (1984; 145-47). Khrushchev has little to say about Biryuzov, despite the latter's key role in the crisis and Soviet military policy. Khrushchev (1972; 15-16) does harshly criticize the behavior in 1957 (at the time of Zhukov's removal) of K.S. Moskalenko who went on to become CinC SRF before Biryuzov replaced him. Unfortunately, Khrushchev does not provide any insight into why he entrusted Moskalenko, whom he considered "mentally unbalanced" with the most important service command of the Soviet armed forces.

9 Scott and Scott (1984; 145).

10 "Marshal Sovetskogo Soyuza S.S. Biryuzov" (1984).

ly been in bomber aviation (*dal'naya aviatsiya*--long range aviation--DA) rather than in air defense.[11] Perhaps Khrushchev felt that the VPVOS could profit by learning from the bomber forces, or more likely, Sudets had succeeded in ingratiating himself with Khrushchev.

Sudets did not last very long in the post, and in July 1966 he was **replaced by** Marshal P. F. **Batitskiy**, an officer of wide experience. Although a ground forces commander during the Great Patriotic War, in the post-war period Batitskiy served in various posts in the Soviet Air Force and later the VPVOS. From 1954 to 1965 Batitskiy was Commander of the Moscow Air Defense District, the highest operational command after the Commander in Chief and First Deputy Chief of the VPVOS.[12] In 1965 Batitskiy was promoted to First Deputy Chief of the General Staff and Erickson suggests that he was chosen in order to put in place a younger officer with more experience with modern weapons systems.[13] This explanation seems plausible and Batitskiy's experience in both the Ground Forces and VPVOS would have given him a wide and varied perspective.

When Batitskiy returned to the VPVOS he had experience in both the VPVOS and in the central apparatus of the General Staff. Batitskiy appears to have been given a **mandate to clean house** in the VPVOS, for he replaced several top ranking VPVOS officers with new appointees.[14]

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11 Akhromeyev (1986; 717), Scott (1984; 79).

12 Scott and Scott (1984; 81-82), also see Batitskiy's obituary in *Krasnaya zvezda*, February 19, 1984 p. 3.

13 Erickson (1971; 17).

14 Thus Colonel General G. Zimin was replaced as First Deputy Commander by Army General Shcheglov, formerly commander of the Baku Air Defense District. Zimin was sent to head the VPVOS's military command academy. This removal suggests that the performance of the top VPVOS leadership was unsatisfactory and that Batitskiy wanted to choose his own team. However, Zimin appears to have maintained a fairly influential position and clearly was not completely disgraced. Zimin's demotion at least kept him within the VPVOS in a fairly important position, while being shipped out to the General Inspectorate (as Sudets was) would have taken him out of the

After all these changes in the VPVOS top leadership the policy of stability of cadres took over, and there were only routine changes until 1978 when Batitskiy was replaced.

One other important aspect of Soviet military policy must be mentioned: the gradual increase in defense budgets beginning in the mid-1960s.[15] The budgeting allowed sufficient funding for both the buildup of conventional and strategic nuclear forces.

Overall, then, the VPVOS was dealing with a very rapidly changing environment, both in terms of the U.S. threat and in terms of Soviet leadership and doctrine. Within this context the VPVOS had to define its roles and missions and develop forces to meet the changing threat.

5.3 VPVOS Responses to the Changing Environment

The VPVOS response to the new developments in technology and doctrine took two rather different paths. In the case of air defense the development and deployment programs seem to have followed the trends begun in the 1950s, particularly the rapid buildup of SAM forces. But the new ICBM threat could not be dealt with using old air defense technology: it presented a major challenge to the VPVOS. The VPVOS's goal was to prevent

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policymaking loop completely. Other personnel changes included moving Marshal of Aviation Ye. Savitskiy from chief of IA to a Deputy Commander position, replacing him with General Lieutenant of Aviation V. L. Kadomtsev in his place. The timing of these changes is somewhat unclear. Savitskiy is listed as a Deputy Commander from 1966 in Akhromeyev (1986; 650), but the identification of Kadomtsev as in charge of IA VPVOS is only from the end of 1967 (Erickson 1971; 20). His obituary (*Krasnaya zvezda* April 30, 1969 p. 4) does not shed any light on the timing of his appointment.

15 CIA (1978; 1-2).

the destruction of the Soviet civilian and military infrastructure, and to accomplish this goal ICBMs had to be countered as well as bombers. In the sections below VPVOS responses to both the air and missile threats are examined. As we shall see, while the air defense mission was marked by a fairly clear definition of goals and means the missile defense mission was characterized by technological uncertainty and controversy. Both of these cases reveal different aspects of the Soviet defense decisionmaking process and are worth examining in some detail.

5.3.1 VPVOS Operational Art in the 1960s

Soviet sources from this period provide us with some insight into the principles of creating and deploying a nationwide air defense system for urban-industrial defense. Indeed, discussions in the historical literature provided a forum for addressing contemporary issues.[16] From this literature we may distill both the basic principles of VPVOS operational art but also the concerns and problems they foresaw in conducting defensive operations.

VPVOS operational art was created during the Great Patriotic War and reflects the artillery heritage of the AAA forces. Indeed, its principles are closely tied to those of Soviet military science as a whole. The basic principles are:

--The importance of combat readiness[17]

--Circular, deeply echeloned defenses around objectives with strengthening in the most likely directions of attack.[18]

16 Rumer (1988; 40-60).

17 Biryuzov (1961; 17), Zimin (1965; 113).

18 Desnitskiy (1959; 40-41), Yerofeyev (1961; 63-4).

--Defense of entire zones, as well as point defense.[19]

--massing of troops and their concentration along major axes of attack.[20]

--maneuver of forces to concentrate them, evade enemy attacks and support mobile forces.[21]

--close interaction of branches (IA and AAA or SAMs)[22]

--centralized control of all forces and means.[23]

Taken together, these principles comprise the basis for the anti-air operation that the VPVOS presents as a single coordinated battle over a wide area and long time against enemy air attacks.[24] The anti-air operation is elaborated in even more detail later in the decade and becomes the centerpiece of VPVOS operational art. The core concept of the anti-air operation is the centralized control of VPVOS forces over a very wide expanse with every aspect of the operation controlled by a high-level command post, with lower level command posts only responsible for tactical execution. Instead of a decentralized system, dealing with threats as they arise, the intent is to develop a highly centralized system that can divine the enemy's strategic plans and intentions, and deploy and assign forces in the most effective manner to thwart them.[25]

The classic example of the anti-air operation, and of the defense of a large city, is the defense of Moscow in Autumn 1941. While this battle

19 Biryuzov (1961; 20).
20 Desnitskiy (1959; 50).
21 Yerofeyev (1961; 64).
22 Yerofeyev (1961; 64).
23 Yerofeyev (1961; 63-64).
24 Biryuzov (1961; 20).
25 Batitskiy (1968; 356).

is featured in almost all works on VPVOS history the most extensive and informative analysis of the battle appeared during the heyday of city defense in 1959.[26]

Written by Major General of Artillery G. Desnitskiy, the article reflects the basic principles of VPVOS operational art. The defenses are described as circular and echeloned in depth, with the most probable directions of attack strengthened.[27] Both AAA and IA units were concentrated around the capital, producing an air defense system that Desnitskiy claims was stronger than that of any other capital in World War II.[28]

While Desnitskiy presents a favorable picture of the Moscow PVO, he does note some tactical problems.[29] But Desnitskiy argues that the experience of Moscow confirmed the basic principles of PVO operation worked out before the war: massing of troops, deep echeloning, and circular combat formations around the defended objective.[30] He also observes that IA proved to be a highly maneuverable means of PVO, as well as being used for ground support during the Moscow counteroffensive.

Desnitskiy's article sets the stage for many later discussions of the air defense of Moscow, but unlike them it gives a large number of

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26 Desnitskiy (1959). Other articles on the defense of Moscow include: Svetlishin (1966), Mikhaylenko (1977), Mikhaylenko (1979), Koldunov, (1981). A number of other articles also discuss the defense of Moscow in passing.

27 Desnitskiy (1959; 40).

28 Desnitskiy (1959; 41).

29 There are sharp criticisms of the effectiveness of AAA barrage fire, barrage balloons, the lack of modern PVO equipment at the beginning of the war and the shortage of transportation. See Desnitskiy (1959; 38-41, 51, 52).

30 Desnitskiy (1959; 50).

statistics on damage sustained as well as bombers shot down, and is more even-handed and critical than celebratory.[31] For example, Desnitskiy admits that German bombing did have an effect on civilian morale, a very rare admission.[32] Desnitskiy's main point is that in comparison to London and Germany, the strong VPVOS defenses managed to reduce damage from bombing substantially, essentially making Moscow the only wartime European capital to escape serious damage.[33] Although Desnitskiy does not give an overall penetration figure, his damage statistics suggest a fairly low one, and his data indicate a kill rate approaching 10%--very high for World War II. (See Table 3.1). Even so, these numbers are somewhat less optimistic than the standard figures adopted in later VPVOS literature, that claim a 2-3% overall penetration.[34] These penetration rates are extremely low by Western standards, and suggest either innovative counting methods or an extremely strong defense.[35]

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31 Desnitskiy (1959; 50-51).

32 Desnitskiy (1959; 46). No other Soviet article on the defense of Moscow has admitted that the bombing lowered the morale of the population.

33 Desnitskiy (1959; 49-50).

34 See Table 3.1 and Batitskiy (1972a; 17). Note that this figure seems to be based on the standard Soviet history of the Great Patriotic War. Attrition is the percentage of the attacking bombers that are actually shot down. The penetration rate is a measure of the number of attacking bombers actually making it to the target. The two are usually complimentary (i.e. penetration rate = 1-attrition rate) but may not be if many aircraft turn back without being destroyed, either due to damage, poor navigation, or breaking off the attack. The great difference between attrition and penetration rates for Moscow suggests that the latter was a very important phenomenon.

35 It is most likely, though, that the Soviets are measuring "penetration" as the number of aircraft reaching the center of the city out of the number entering the entire Moscow PVO corps region. Thus, even if aircraft were not headed for downtown Moscow they might have been counted as "averted" if they appeared in the Corps region. Finally, it should also be noted that even post-war Soviet figures are subject to exaggeration, perhaps by as much as factors of 2-3.

Moscow is thus presented as a classic example of successful air defense. It is held out as proof of both the correctness of VPVOS operational art and, by implication, of the feasibility of city defense as a whole. Certainly, if attrition rates of 10% and very low penetration rates could be accomplished with the relatively unsophisticated equipment of 1941 then some 20 years later the new technology could be expected to produce substantially greater results. Furthermore, Desnitskiy's article suggests that the key to successful PVO lies as much as anything in the organization and control of the defenses.

In contrast, an article describing the air defense of Berlin illuminates a number of important issues in its criticism of those defenses.[36] Colonel T. Yerofeyev[37] critically examines the Berlin defenses, noting a number of deficiencies and implicitly comparing the defenses with those of Moscow. Yerofeyev's criticisms are particularly interesting as most Western authors consider the German air defense system the most sophisticated deployed during the war.[38]

Yerofeyev criticizes the absence of centralized control and circular defenses as lowering the effectiveness of the defenses.[39] Yerofeyev also points out the fact that Berlin had little in the way of mobile defenses,

36 Yerofeyev (1961). This is one of very few articles on the air defense of a non-Soviet objective.

37 Yerofeyev became a prolific historian of the VPVOS, although most of his articles were published in *Vestnik protivovozdushnoy oborony* rather than *Voyenno-istoricheskiy zhurnal*.

38 See Faber (1977; 243-251), Hastings (1979; 266-276). In terms of arms (the Germans had higher-caliber, hence higher altitude, AAA), radar equipment, and night fighters the Germans established a very capable system, far more sophisticated than that deployed around Moscow.

39 Yerofeyev (1961; 63-4).

and thus could not maneuver forces or easily concentrate them.[40] Particular importance is also placed on the interaction between IA and AAA, and their interaction in one zone, which Yerofeyev notes has special significance for the present.[41] Concerning effectiveness, Yerofeyev states that the attrition rate of Berlin's AAA ranged from 2-3% to 5-7%, a level that he considers not very effective. IA forces are credited with an attrition rate of 4 percent in 1943-44.[42] These attrition rates are consistent with Western estimates, if perhaps a bit high, and may be intended for comparison to the higher rates attributed to the Moscow air defenses by Desnitskiy.

Yerofeyev may be responding to arguments that if even the Germans were unable to attain high attrition rates, how could the VPVOS hope to do so? The answer is clear: **the Germans did not properly structure** and control their air defense forces and therefore did not achieve their full potential. Thus, Yerofeyev criticizes the Germans for not incorporating many of the principles of VPVOS operational art. By implication, the proper organization and control of modern VPVOS forces (as specified by VPVOS operational art) can maximize the performance of the new weapons and achieve even higher effectiveness.

The historical literature thus provides some important insights into VPVOS operational art and planning: it outlines the principles of con-

40 Yerofeyev (1961; 64).

41 Yerofeyev (1961; 64).

42 For the period from 1943 to March 1944, there were 15 mass flights and 28 flights of smaller groups of bombers on Berlin, a total of 3900 sorties,against which the Germans launched 1466 fighter sorties, on average 100 sorties versus each flight. German fighters destroyed 155 bombers, for 9.5 sorties per destroyed aircraft. While no comparative numbers are given, the per sortie kill rate seems to be quite high. See Yerofeyev (1961; 56).

struction of PVO systems and indicates the great weight given to the proper organization of their command and control. Furthermore, these basic principles can provide a guide for examining and understanding VPVOS force structure and deployments, as is done below.

5.3.2 VPVOS Modernization and Force Structure

During the 1960s the VPVOS continued a program of modernization and weapon development. Initially there appears to have been a strong emphasis on SAMs, possibly due to Khrushchev's stress on this weapon, but by the early 1970s SAM deployments began to slow and stabilize while fighter-interceptors began another round of modernization.

The 1960s saw a gradual decrease in the number of interceptors from about 4000 in 1960 to 3300 in 1970.[43] (See Figures 5.1 and 5.2.) But while the quantity declined quality increased as the older MiG-19 and Yak-25 aircraft were replaced with MiG-21 and Yak-28 interceptors with increased speed and improved all-weather capabilities.[44] In the late 1960's a new round of modernization started, drawing down the number of interceptors to approximately 2600 by the mid-1970s.[45]

In the area of SAMs, the Soviets pursued a fairly aggressive deployment program through the early 1970s, as shown in Figure 5.3. The chief aspect of this program was the deployment of the SA-2 high-altitude SAM

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43 Kilmarx (1963; 266-7), Berman (1977; 16). The latter gives a 1960 figure of about 5,000 fighters.

44 Berman (1977; 15-17).

45 This second modernization replaced the MiG-21 and Su-9/11 with more modern MiG-25, Mig-23 and Su-15/21 aircraft. See Berman (1977; 16-18), Erickson (1976; 43-45). On Figure 5.1 this modernization is represented under the heading "Total Modern Interceptors."

and the SA-3.[46] The SA-3 was designed to intercept low altitude aircraft, thus countering attempts to fly under the SAM screen. Most of these missiles were deployed around urban centers (particularly Moscow) in the Western USSR and military targets. Some sources also indicate that the SAMs are deployed in bands, like echelons, with particularly dense concentrations in the North and West border areas, and with some bands across the European USSR. ICBM and military airfields may also have concentrations of SAMs for point defense.[47] Such a deployment would be consistent with the VPVOS emphasis on in-depth echeloned defenses, as well as the need to provide for interception of bombers as far forward as possible before they could launch air-to-surface missiles.

In the late 1960s the SA-5 was deployed.[48] As will be discussed later, the SA-5 caused a controversy in the West over its possible ABM capabilities, as the missile was designed to intercept high speed, high altitude aircraft which the West did not deploy. By the early 1970s SAM deployment had stabilized at approximately 10,000 launchers, although the number of rails continued to increase as 2-rail SA-3 launchers were replaced with 4-rail launchers.[49]

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46 See Wright (1986; 551-53, 559-61) on force levels for these missiles. Note that there is a gradual drawdown of SA-2s after 1969 while SA-3 and SA-5 deployments continue. It has been suggested that the SA-2s were being replaced by the new SA-3s.

47 Wright (1986; 553, 561), Erickson (1976; 45), Berman (1977; 19). Unfortunately relatively little is known about the details of SAM deployment, with the notable exception of the Kola peninsula (thanks to commercial satellite photographs). See Ries (1984).

48 Wright (1986; 572-74).

49 A rail is a missile position, while the launcher is the unit that holds and aims the rails. Doubling the number of rails per launcher is a cheap means of increasing firepower as it requires no extra personnel and can make use of existing reloads. Whether it makes an appreciable difference in effectiveness is another matter. The SA-2 has one rail per launcher.

The Radiotechnical troops continued to upgrade their radar systems and a notable step forward was the deployment of their first airborne early warning (AEW) aircraft, the Tu-126 Moss. While often referred to as the Soviet AWACS, there is little doubt that the capabilities of the Moss were greatly inferior, and less than a dozen were deployed.[50]

But despite this impressive buildup and modernization of forces, the VPVOS force structure still had serious weaknesses and in some respects the 1960s buildup did not seem to be optimized against the developing threat.

First, there was the problem of low-altitude penetration. In response to the development of high-altitude SAMs and improved radar and interceptors SAC had started low-altitude flight training in the late 1950s.[51] Thus, as the VPVOS deployed the SA-2, SAC was circumventing it by flying at altitudes where the SA-2 was ineffective. The SA-3, designed for low-altitude defense, was intended to plug this gap, but as the experience of the 1973 Mid-East war and limited use in Vietnam showed, it was not very effective. Nonetheless, the VPVOS continued to deploy new SA-3 launchers until 1976, as well as increasing the number of rails per launcher.[52]

Fighter aviation forces seemed somewhat better prepared to deal with the low altitude threat, but their effectiveness was still questionable. The (second) generation of aircraft introduced in the mid-1960s were not equipped with radars capable of tracking even large bombers at low

50 See Hirst (1983; 145-53). For an overview of Soviet assessments of Western work in the field of AEW see Lepingwell (1986; Chapter 4).

51 See Berman (1977; 16).

52 Wright (1986; 560).

altitude--Soviet technology seems to have been incapable of developing such systems. Furthermore, some of the new aircraft (particularly the Su-15) had been designed during the Khrushchev years (when the primacy of the air-to-air missile was espoused) and were not equipped with cannon.[53] This omission, while common to many fighter aircraft of the 1960s, meant that the aircraft had to rely exclusively on their air-to-air missiles--weapons that had not been fully combat tested. As many U.S. pilots discovered over Vietnam, these weapons were often quite unreliable.[54] Since the missiles were least effective at low altitudes (due to ground clutter for both infrared and radar-guided missiles) the lack of cannon was a serious omission. While later modifications of these aircraft and the subsequent third generation aircraft were equipped with cannon, the deployment of these new aircraft may actually have decreased the effectiveness of the IA force due to the lack of cannon and to the decreased maneuverability at low-altitude.[55]

The other attack option available to pilots was ramming--a much-celebrated tactic used in the Great Patriotic War and even in modern con-

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53 See Panyalev (1977a,b,c) for a description of some of the modern aircraft.

54 Fallows (1982; 55, 99). While part of the problem was the lack of effective IFF (identification friend or foe) the lack of cannon seriously hampered the air combat capability of U.S. aircraft. See also Nordeen (1985; 16-17, 42-45).

55 See Berman (1977; 45-54) for a discussion of Soviet aircraft design and parameters affecting maneuverability. My conclusion is primarily based on Berman's wing-loading data. It is true that the new aircraft had greater thrust-to-weight ratios and were designed for missile intercepts, but for the reasons outlined above these advantages were probably cancelled out by the lower maneuverability. Berman does, however, point out that later models of the Su-15/21 featured improved low-altitude performance. Cockburn (1984; 229-31) also cites some Israeli and U.S. pilots on the superiority of the older MiG-21 to the MiG-23 for air combat.

ditions.[56] Given the high value of a nuclear-armed strategic bomber this tactic presents a good trade-off and has been explicitly endorsed in the VPVOS press, but ramming requires flying skill at least as great as that for gun attacks and would be unlikely to greatly increase VPVOS effectiveness.[57]

The conclusion of most Western analysts is that the VPVOS did not present a very effective defense against low altitude penetration during the 1960s and 1970s.[58] But low-altitude penetration was clearly not the only threat concerning the VPVOS.

The second threat of concern to VPVOS officers was the development of high-altitude, high-speed aircraft such as the B-70 Valkyrie. But even though the B-70 was canceled in 1967, the VPVOS continued to deploy weapons some years afterwards that appear to have been designed to combat it.[59] These weapons were thus deployed to counter a threat that did not

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56 Hardesty (1981; 27-30), Belenko (1988; 96,98), "Bditel'nost i reshitel'nost--chest' i doblest' voina PVO" (1987; 3-4).

57 For an authoritative comment on the application of ramming tactics to modern warfare see Pokryshkin (1983; 66-67). Note that if from the start the aircraft were vectored head-on the pilot might stand a good chance of a successful (if fatal) ramming, but from other attack positions against a maneuvering target the problem might be very difficult.

58 Berman (1977; 18-20) reaches this conclusion, and also cites a Joint Chiefs of Staff estimate indicating that 70-80% of U.S. bombers could penetrate to their targets. This estimate of penetration seems rather low, as it requires attrition rates some 5-10 times higher than those usually experienced in modern air combat. Quanbeck and Wood (1976) present a detailed study of air defense effectiveness in the 1970s that concludes that Soviet PVO forces are unlikely to be highly effective (see p. 83-84). Erickson (1976; 43) does not give any quantitative estimates but also notes the VPVOS's "inability to cope with the low-altitude bomber."

59 On the reasons behind this decision and the proposed missions of the B-70 see Enthoven and Smith (1971; 243-51). Some of the early history of the B-70/RS-70 is recounted in Hunter (1973). The B-70/RS-70 proved remarkably resilient and resisted final cancellation for several years, so it is perhaps not surprising if the VPVOS did not consider it finally and irrevocably cancelled.

exist and were of little use against the weapons that did exist. The deployment of these weapons, the SA-5 SAM and the MiG-25 Foxbat interceptor, have often been presented as examples of Soviet "bureaucratic inertia" and conservatism.[60] Are they in fact examples of bureaucratic inertia, and if so how can we explain such apparently gross irrationality?

As with most such cases, the development of the MiG-25 and the SA-5 are combinations of rationality, rationalization, and organizational interests. Let us examine their development chronologically.

In the late 1950s--early 1960s the future of airpower was believed by many to lie in high-altitude high-speed flight.[61] All the past trends in aviation emphasized flying higher and faster, and it was believed by many that this was also the best means to penetrate enemy air defenses. Indeed, SAC's transition to low-altitude penetration almost appears to have been a temporary measure until the B-70 was available. The U-2 shootdown demonstrated to many, however, that high-altitude was not an effective means of evading air defenses, and that high speed would not provide much more protection.[62] Despite SAC's pressure for the B-70, it was shelved by Defense Secretary McNamara in 1962-63, and permanently canceled in 1967.[63] Thus, by the early 1960s the B-70 threat was diminishing.

But while the B-70 was being canceled, the VPVOS could see other threats being developed in the U.S. One was the B-58 Hustler medium range bomber created for both high and low altitude supersonic flight. But the B-58 suffered from poor range and overall performance and it was phased

60 Cockburn (1984; 355-56, 361-62), Alexander (1978/9; 34).
61 Kravchenko (1966; 45-46).
62 Enthoven and Smith (1971; 243-45).
63 Hunter (1973; 193-94).

out of the SAC inventory during the 1960s. The other threat was the SR-71 strategic reconnaissance aircraft. The SR-71 shared many attributes with the B-70, flying at approximately 3000 Mph at altitudes of 100,000 feet, far beyond the reach of interceptors and SAMs. While the U.S. DoD and SAC considered the SR-71 only a reconnaissance aircraft, as with the U-2, the VPVOS may have perceived it somewhat differently. Again, there was no reason why the reconnaissance payload could not have been stripped out and the aircraft modified to carry nuclear weapons.[64] Such a modification would perhaps take several weeks or months, but this would be a much shorter period than that required to create a high-altitude PVO system on the Soviet side. Even though only a small number of SR-71s were built, in the mid-1960s the extent of the production run was probably not known to the Soviets and the possibility of greatly increased production could not have been ruled out.[65]

These fears concerning the SR-71 do not appear to be well-founded in light of the development of the program, but they may have been factored into the VPVOS decisionmaking process. Indeed, in the mid-1960s forecasting future trends in the development of aviation was more difficult than it appears in hindsight. While Western analysts may dismiss the SR-71 in retrospect, to the Soviets it presented a very real and significant threat.[66] In addition to the SR-71 threat, SAC B-52s were being armed

64 Beschloss (1986; 393-94) indicates that the SR-71 may have had a capability to carry light nuclear weapons without modification. "Light" in this context, however, could mean several hundred kilotons.

65 Soviet concern with the SR-71 is noted in Barron (1981; 100-101).

66 The SR-71 apparently has never operated over Soviet territory, but it has operated very close to Soviet airspace and has conducted deep overflights over the PRC. Beschloss (1986; 393-94) suggests that either SR-71s or drones launched from them may have penetrated Soviet airspace in the 1960s, while Hersh (1986; 221) notes that an official decision forbidding all penetrations of Soviet airspace was not made until 1970. This suggests that at least shallow penetrations by drones may have been con-

with the Hound Dog air-to-surface missile during the 1960s, and the SA-5 has sometimes been explained by those opposed to the "bureaucratic inertia" explanation as designed to destroy these missiles (and later the B-52's short-range attack missiles--SRAMs).

In the early and mid-1960s, then, the VPVOS faced an unclear threat picture that could include a high-speed, high-altitude component. Under these circumstances the continued development of the SA-5 (probably started in the late 1950s--early 1960s) may have seemed a prudent hedge against a nebulous threat. Since deployment of the SA-5 appears to have begun in 1966 or 1967 the deployment decision was probably made in 1965 or earlier.[67] But in 1965 the fate of the B-70 was not sealed, and the other threats listed above were still extant. In addition to these threats elements of VPVOS operational art must also have figured in the decision, in particular the desire to intercept bombers equipped with air-to-surface missiles before the missiles could be launched. Combined with this was the operational art principle of ensuring all-altitude coverage. Finally, there may have been some interest in deploying the SA-5 as a precursor for an eventual ABM system.[68]

All these factors point towards a semi-rational decisionmaking process concerning the SA-5. At its inception the missile was intended for a certain set of targets, but by the time the SA-5 was ready the threat picture had changed and it was assigned to less clearly defined missions.

(continued)

ducted up to 1970.

67 Wright (1986; 572-73)

68 It was this possible rationale that caused much debate in the U.S. intelligence community, as described in the next section. See Stevens (1984; 204-209), Freedman (1986; 90-94).

The deployment of the SA-5 was not an irrational decision as it met VPVOS needs to counter any possible high-altitude U.S. "breakout", it might have had some utility against the Hound Dog, and it might have been able to destroy some bombers before air-to-surface missile launch. Although any one of these reasons would not be sufficient to require the development and deployment of the SA-5, the combination of them, together with an existing system with high sunk costs, appears to have tipped the scale in favor of deployment.

The deployment of the SA-5 was a result of shifting threats and mission definitions, and is simultaneously a rational decision and a product of bureaucratic inertia. Indeed, this process of developing a weapon to counter one threat only to divert it to another when it is finally ready is well known in the U.S. military and has acquired a special name, "the boxcar effect."[69] The decisionmaking process may be broadly rational, but we must take into consideration the changing threats, missions and values of the organization, as well as its sensitivity to sunk costs. Once the deployment of the SA-5 system was begun, organizational and bureaucratic inertia may well have taken over and continued the program even after the threat became more clearly defined.

Much the same argument may be made for the MiG-25, although since its deployment started several years later (in 1970), the threat picture should have been clarified.[70] In this case the arguments for the aircraft may have differed somewhat. The MiG-25 embodied some useful concepts,

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69 Weissinger-Baylon (1986; 49-50). This phenomenon is discussed in the context of the garbage can model with its emphasis on shifting goals and values over time.

70 Gunston (1981; 268).

such as high speed to make the intercept at long range and might have been consistent with the VPVOS's tactic of interception before air-to-surface missile launch, but it lacked the look-down shoot-down capability that would have enabled it to be effective against low-altitude targets.[71] While the aircraft might have been deployed order to make use of its good current qualities, with a view to future upgrades to increase its low-altitude capability, the MiG-25 appears to have almost no capability against strategic or tactical targets.[72] Indeed, to produce a potentially useful aircraft from the MiG-25 airframe required a major modification of the aircraft, resulting in the MiG-31.[73]

Once again, the VPVOS appears to have deployed a weapon that had been developed to counter a threat that had disappeared by the time the response was ready. In the case of the MiG-25 there is even less justification than for the SA-5. It did appear to be an impressive aircraft on paper, and was consistent with Soviet preconceptions concerning the proper engineering of high-performance aircraft (high altitude, high speed).[74] Against the main target of the VPVOS, low altitude penetration

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71 U.S. plans to deploy a similar, but higher-performance aircraft with look-down, shoot-down capability based on an airframe similar to that of the SR-71 were cancelled well before the MiG-25 deployment. See Knaack (1978; 330-31, 333-34).

72 Ironically the MiG-25 threat was one of the arguments used by the USAF to justify the development of the F-15 fighter that has become one of the chief threats to Soviet aviation. See Gunston (1981; 252).

73 On the MiG-31 see Department of Defense (1987; 60). There was also an intermediate upgrade, the MiG-25E, see Department of Defense (1984; 37).

74 These were also reflected in the biases of the aircraft design bureaus, most notably that of Mikoyan and Gurevich, whose motto was "speed and altitude." See Alexander (1978/9; 34). Barron (1981; 177-182) also notes that the MiG-25 was designed to counter the B-70 and was not intended to engage in air combat. Despite this he argues that it was a highly capable and successful aircraft.

by B-52s or FB-111s the MiG-25 would have been almost entirely ineffective. In this case the organizational biases of the VPVOS, combined with the uncertain threat picture combined to produce an ineffective aircraft.

In the cases of the MiG-25 and the SA-5, we see the effects of internal organizational behavior as the primary factors involved in the decisionmaking process. Unlike some portrayals of a mindless bureaucratic process, however, the integrated model and the factors considered above, indicate that there was a broad rationality at work in the deployment process. While many of the weapons specifications and threat forecasts were developed by the VPVOS, approval of the General Staff would have been required for final deployment. Such approval could not have been forthcoming without some reasonable missions for these weapons to fulfill. As argued above, there were missions that these systems could plausibly fulfill, and these appear to have been sufficient to tip the scale in favor of deployment. While the decisionmaking process in this case appears to have taken place largely at the service level, it was consistent with Soviet strategy and was approved by the General Staff level. Hence, we see the organizational politics aspect of organizational behavior most strongly at this, the operational art level of decisionmaking.

In the case of anti-missile defense, examined below, the decisionmaking process was very different, with all levels engaged in the debate over deployment. First the VPVOS position on missile defense is examined, then the similarities and differences between the air and missile defense cases are discussed.

5.4 The VPVOS and Anti-Missile Defense

The response to the development of ballistic missiles on the part of the VPVOS and the Soviet military and political leadership was quite different from that of the United States for a number of historical, organizational, and military reasons. In this section the decisionmaking processes that led to the changing soviet positions on anti-missile defense (PRO) are examined. It will be seen that the changing positions, like many of the others described above, had their roots in a basically rational policy that was colored and to some degree distorted by organizational interests.

5.4.1 The VPVOS and Missile Defense

VPVOS interest in, and development of, anti-missile (PRO) systems began in the early 1950s when the great potential of ballistic missiles became clear. By the early 1960s work had progressed to the initial deployment stage. Indeed, it is likely that much of the early research and development work on PRO systems was based on SAM research.[75] In the early 1960s the revolution in military affairs was still in full swing, with Khrushchev as its chief proponent, and it was Khrushchev himself who made the first explicit public comments on the subject of PRO, including his famous statement that the USSR "can hit a fly in outer space."[76] The public pronouncements of both Khrushchev and Chief of the General Staff Biryuzov evinced strong support for the PRO program, and they were repeated by Marshal Sudets.[77] The idea of defense against nuclear attack

75 Stevens (1984; 194-7).

76 Quoted in Wolfe (1964; 190).

77 Wolfe (1964; 190). It should be noted that in his memoirs Khrushchev (1972; 533-34) decrys the ABM race as an example of "how idiotic the arms race is." But his description of the developments in the program is superficial since many of them took place after his removal. In this case, Khrushchev seems to be arguing a fashionable position, or engaging in hindsight, and does not mention his apparently large role in early ABM

had already been accepted by both the military and political leadership, as illustrated by the rapid growth of the VPVOS during the 1950s. In the late 1950s, early 1960s, this agreement carried over to PRO.

From the perspective of the VPVOS, PRO was not only an integral part of its overall mission, it also represented the key to the future development of the service and the continued viability of the air defense component. VPVOS leaders were doubtless aware (particularly in the early 1960s) of Western debates over the futility of air defense without a defense against ballistic missiles and may have been concerned that such arguments would be used in the USSR. Furthermore, it is most likely that professional "defenders" such as Batitskiy would have wholeheartedly, not just cynically, believed in the necessity for creating a strong PRO defense, rather than relying upon deterring the "Imperialists."

There is good evidence that the development of PRO systems was strongly endorsed by the VPVOS. For example, Biryuzov in 1961 observed that in the near future there would be a transition from anti-aircraft to anti-missile defense.[78] These comments were echoed in later pronouncements by VPVOS leaders such as Colonel General Zimin, Marshal Sudets, and later Marshal Batitskiy.[79]

Whether there was any intra-service dissent on this stress on PRO is unclear. Certainly the IA branch had little to gain from increased fund-

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work.

78 Biryuzov (1961; 26).

79 Zimin (1965; 115), Batitskiy (1967a; 26). Sudets did not write very much during his brief tenure and produced no comprehensive article outlining his view of the VPVOS and the role of PRO within it. Wolfe (1964; 190-91) reports on Sudets's positive views towards PRO.

ing for PRO, except perhaps for continued viability of the air defense mission as a whole. For the SAM Troops troops the issue is less clear. If a separate PRO branch was established it would represent significant competition for the SAM Troops in both funding and personnel.[80] If a PRO branch was not created, the SAM Troops may have attempted to capture the mission, thereby raising its institutional status still further. Finally, the Radiotechnical Troops may have remained neutral, as the expansion of either PRO or anti-aircraft activities would have required radar support by the RTV.

Within the VPVOS, then, it is unlikely that there was strong opposition to the PRO concept, particularly if the funding were obtained at the expense of the other services (particularly the Ground Forces and Soviet Navy), which in fact appears to have been the case in the 1960s.[81]

The organizational politics model suggests that the VPVOS should have been a strong advocate of the PRO mission, and as the evidence below indicates, this seems to have been the case. Equally important, though, is the process by which the overall issue of PRO development was debated and the impact of the outcome on Soviet strategy and VPVOS operational art. Other authors have studied this debate in some detail, and their work will be used as a background for this more focussed study on VPVOS organizational response to the PRO issue.[82]

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80 Some authors (Ghebhardt (1975; 40)) claim that a PRO branch was established in the late 1950s or early 1960s but there is no Soviet source for this information and no authoritative Western statements based on intelligence data to support this assertion.

81 CIA (1978; 5-6).

82 See the analyses by Holst (1969), Wolfe (1970), Ghebhardt (1975), Deane (1980), Stevens (1984), Garthoff (1984) and Parrott (1987). Many of these authors implicitly use a bureaucratic politics model, and Alexander Ghebhardt uses it explicitly. Ghebhardt tends to extrapolate too far from the available evidence and includes some unfounded assumptions and assertions but overall presents a good overview. Deane (1980) presents a dis-

5.4.2 The Soviet PRO Program

In 1961 U.S. intelligence detected signs near Leningrad of the preparation of sites, and later limited deployment, of a potential PRO missile, code-named the Griffon.[83] Although this missile was displayed at the November 7 parade in 1963, construction was halted and the existing sites were dismantled that year. At about the same time construction work started on new sites near Tallinn as well as some of the old Leningrad sites.[84] These sites caused great controversy in the U.S. over their possible PRO capability, particularly after the SA-5 was deployed there.[85]

In addition to work on the Tallinn system, in October 1962 construction work on the Moscow ABM system appears to have begun. But the work was sporadic and did not progress rapidly until 1965, with a further acceleration in work in the second half of 1966. The Galosh exoatmospheric interceptor missile was displayed in November 1964, further confirming Soviet development of PRO capabilities.[86] In 1967 work on two of the in-

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cussion based on Soviet sources, arguing against the position that bureaucratic politics played an important role in PRO decisionmaking.

83 Freedman (1977; 91), Prados (1982; 152-1555).

84 Freedman (1977; 91) states that work halted in 1962 was reorganized, and then in 1963 stopped completely and dismantling began. Prados (1982; 155) is unclear as to the relative timing of the cessation of work on the Leningrad system and the start of work on the Tallinn system.

85 Prados (155-157, 164-171), Freedman (1977; 90-94). There is some doubt as to whether the Griffon displayed at the parade and the SA-5 later deployed were the same. Prados implies that they were the same but Stevens (1984; 205) notes that "The SA-5 missile appeared to have some relationship with the Griffon interceptor used by the Leningrad system." Thus, the Griffon may have been intended for PRO use, while the SA-5 was a version developed for air defense. In any case, the similarity of the two systems combined with the high performance of the SA-5 gave rise to much concern over the possible upgrading of the SA-5 to PRO capability.

86 Freedman (1986; 88-89).

terceptor complexes was stopped or put on hold while other construction continued, and in 1968 work on another two interceptor complexes was halted.[87] Instead of the originally planned 128 interceptors, only 64 were actually deployed. Thus there is evidence that Soviet leaders were having doubts about either the effectiveness or cost of the Galosh system at this time.[88] By 1970 or 1971 the system probably became operational.[89]

5.4.3 The PRO Debate

The real debate over PRO did not begin until the Brezhnev-Kosygin regime had settled into power and begun a reappraisal of Khrushchevian strategy and doctrine. The PRO program was apparently one of the chief items to be examined. One impetus for this growing concern was the rising cost of the Moscow ABM system. While specific cost data for this project is not available, CIA defense budget data for the period 1967-1970 shows VPVOS funding growing at a rate significantly greater than that of the defense budget as a whole, and after the ABM treaty growing at a much lower rate.[90] This data suggests that the Moscow ABM system was very expensive, a factor that must have raised its visibility. If the Moscow ABM system was costly the possible expense of a nationwide PRO system would have been extremely high. Although no other PRO sites were under development, the VPVOS's concept of territorial defense would call for a nation-

87 Freedman (1986; 88-90).

88 For a more detailed discussion of Soviet views on PRO see Holst (1969) and the other sources cited above.

89 Freedman (1986; 88).

90 CIA (1978; 5-6).

wide (or at least European-USSR wide) defense. Given the potential cost of such a program a critical reappraisal of the program seems logical.

Before Batitskiy acceded to the post of Commander in Chief VPVOS the battle lines on PRO had already been drawn. In addition to the comments of Biryuzov and Zimin noted above, a debate on PRO had started in the pages of *Vestnik PVO* and *Military Thought*. The opening shot was fired by Lt. Col. V. Aleksandrov in an article published just four months after Zimin's 1965 endorsement of PRO.[91] While the article ostensibly reviews American work on ABM systems it presents a number of arguments that apply equally well to Soviet systems. The gist of the article is simple: an impenetrable PRO system cannot be built and PRO systems are not cost-effective because the offense can add decoys, radar homing RVs and other penetration aids at a cost much less than that of upgrading the PRO system.[92] Aleksandrov also presents a harsh criticism of the older Nike-Zeus system developed in the U.S. and is very skeptical of the capabilities of the newer Nike-X system.[93] Since the Nike-Zeus (and to some extent the Nike-X) system was similar in many respects to that being deployed around Moscow, these comments may have been aimed at that system more than at the U.S. system.[94] Furthermore, Aleksandrov singles out the problem of discriminating RVs from decoys and clutter as one of the major problems with

91 Aleksandrov (1965).

92 Aleksandrov (1965; 19-20).

93 Aleksandrov (1965; 13-14, 17-19)

94 Interestingly, a similar critique of the Nike-Zeus system was published in *Vestnik protivovozdushnoy oborony* in 1963, although it suggested that the Nike-X program would solve many of these problems. Unfortunately, the article is the only one available from 1963-64, and it is therefore difficult to evaluate it in a contemporary context. See Bragin and Kubarev (1963).

PRO and argued that there was no solution to this problem in sight. Aleksandrov even ventures into political analysis by asserting that there are only relatively small political advantages to be gained over the enemy by deploying the system.[95] Thus Aleksandrov's argument suggests that there are no military or political benefits to the deployment of a PRO system.

Aleksandrov's critique was addressed in an article appearing a year later in *Vestnik PVO*, again in the context of a discussion of U.S. programs.[96] Using the same Western sources, Plyachenko comes to significantly different conclusions. While noting the impossibility of creating an impenetrable PRO system, Plyachenko argues that one can develop a PRO system that demands enormous expenses to penetrate it.[97] PRO is presented as difficult but not impossible, and the ongoing work in the U.S. in this area is presented relatively non-critically. While noting that discrimination is difficult, Plyachenko notes much work on this problem is being conducted and that terminal defenses suffer less from this problem than exoatmospheric interceptors.[98] It is also interesting to note that Plyachenko mentions without criticism the U.S. search for a less expensive PRO system that could be used for defense against a small attack.[99] Plyachenko does not address Aleksandrov's political comments, but this is not surprising given the sensitive nature of the political issues and the

95 Aleksandrov (1965; 19).

96 Plyachenko (1966).

97 Plyachenko (1966; 86). Note that Plyachenko cites the same Western source, Hertzfeld of DARPA, as does Aleksandrov, but presents a diametrically opposed interpretation.

98 Plyachenko (1966; 87).

99 Plyachenko (1966; 86) The system described appears to be a variant of the Nike-X.

placement of the article in the usually technically-oriented "In Foreign Armies" section.

These two articles stake out the two poles of the debate quite clearly. The main point of contention is the cost-effectiveness of the system. The VPVOS author accepted that an impenetrable PRO system was impossible, but argued that the cost advantage favored the defense over the offense, with Aleksandrov asserting the opposite. To a large extent these differing views were based on assessments of the difficulty of discriminating targets from decoys.[100]

The articles discussed above move beyond the pronouncements "debate" of Malinovskiy and Sudets: the issue is not whether all or many missiles will be stopped, but rather how cost effective the PRO system might be when faced with a technologically sophisticated opponent.[101] Thus, the argument was couched in military-technical terms of effectiveness, rather than in terms of arms race or crisis stability. This is characteristic of the restricted purview, and the shared assumptions, of the military leadership. Aleksandrov's article is one of the few exceptions that actually ventures into the real of political assessment, and even then he predicates his conclusions on the preceding technical argument.

At the beginning of the PRO debate Sudets was removed from his post,

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100 There were a number of technical analyses of PRO systems. On the whole, those appearing in the VPVOS press presented some criticisms but tended to be optimistic that the difficulties could be overcome. See, for example, Bragin and Kubarev (1966; 3-4, 13-18), Baryshev (1967), Fayenov (1968), Popov (1968), Baryshev and Kubarev (1970), Ignat'yev and Erlistratov (1971), and Kryakvin (1974).

101 Deane (1980; 34-41) also argues that differing cost-effectiveness estimates were important, but does not see a real bureaucratic politics debate on this point.

having held it for only 4 years.[102] It is most likely that Sudets was removed because of his performance, or lack thereof. Scott suggests that Sudets was removed because of the poor showing of SAM systems in Vietnam while Holst argues that Sudets was too outspoken an advocate of PRO after a decision had already been taken to concentrate instead on strategic offensive forces.[103] While VPVOS weapons did not do well in Vietnam this explanation seems unlikely. First, the commander of the SAM Troops with direct responsibility for the forces was not removed. Second, most of the development of SAMs had taken place during Biryuzov's tenure in the job. Thus, while Vietnam might have been one factor in the decision, it is unlikely to have been the main consideration.

The argument that Sudets was too outspoken an advocate of PRO is largely predicated on an exchange in April 1966 when Minister of Defense Malinovskiy asserted that Soviet PVO could intercept all aircraft but only "many rockets" while Marshal Sudets criticized Soviet efforts in the field of PRO as insufficient.[104] This exchange came shortly before

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102 Sudets was not particularly old at the time and lived until 1981, suggesting that he was not particularly ill or disabled. Akhromeyev (1986; 717).

103 Scott (1984; 79), Holst (1969; 152).

104 Malinovskiy's article was published in *Pravda* on April 16, 1966 (p. 2), while Sudets's reply appeared in *Sovetskaya Rossiya* on April 19, 1966. See Garthoff (1984; 298) for a brief discussion of this exchange. One indication of Sudets's interest in PRO is the attention given to the subject under a special PRO rubric in the journal *Vestnik PVO*. In 1963 it featured 6 articles but the rubric disappeared in 1964 while the number of articles remained relatively constant at 4 in 1964 and 5 in 1965. There seems to have been continuing strong interest in the topic (although the disappearance of the separate rubric may imply a slight downgrading in importance), but does not suggest particularly strong advocacy. See the annual indexes in *Vestnik protivovozdushnoy oborony*, (1963; 80), (1964; 80), (1965; 80). These figures include articles on early warning radar systems and PKO issues. Unfortunately, only the December issues with articles are available for these years so a more detailed analysis of the articles is impossible.

Sudets's removal, but if Sudets had been overly aggressive in his promotion of PRO, his removal does not seem to have dealt the program a major blow, as construction of the Moscow ABM system accelerated in mid-1966, after Sudets's departure.[105] It appears most likely that Sudets was removed because of his advocacy (bordering on insubordination) and the relatively poor PVO showing in Vietnam.

After Batitskiy's appointment in 1966 the debate entered a new phase in 1967 as Batitskiy clarified and enunciated VPVOS views on PRO. Batitskiy was probably well acquainted with the construction (and possibly planning) of the Moscow ABM system as he had previously commanded the Moscow Air Defense District.[106]

Batitskiy's appointment to the VPVOS put in place a capable officer with a strong VPVOS background who became a strong advocate of the expansion of the service's role to include PRO and anti-satellite activities. This advocacy is clearly reflected in the emphasis given to the concept of "aerospace defense" (*vozdushnaya-kosmicheskaya oborona*) as opposed to traditional air defense.

Unlike Sudets, who published no articles in the major military journals, Batitskiy published regularly, giving us greater insight into VPVOS positions and interests. Batitskiy also seems to have been interested in changing and improving the VPVOS's operational art, and military-

105 Freedman (1986; 88).

106 It is unclear if Batitskiy had any direct responsibility for the Moscow ABM system when he was in the Moscow ADD. It is possible that construction of the ABM system was not being carried out through the Moscow ADD (an operational command) but instead either through the central apparatus of the VPVOS or a special PRO branch or administration. Thus if work on the ABM system was going poorly it might not have reflected badly on Batitskiy's performance.

historical writings provided both the basis for, and the opportunity to promulgate, these changes. But while the articles of this period are analytical, they lack the scholarly quality and sharpness of earlier articles. To a large extent this appears to be due to the general clampdown on free scholarship and critical examination of history in the post-Khrushchev years.

In his first editorial in *Vestnik PVO*, Batitskiy did not directly call for the development of PRO systems, but instead noted that troop control needed to be carried out in the most complex *vozdushnoye-kosmicheskoye* (air-space) situations.[107] This hint at an expansion of the VPVOS to incorporate both air and space (anti-satellite--PKO) missions was substantiated and elaborated upon in two articles, one in *Voyenno-istoricheskiy zhurnal*, and one in *Military Thought*.

In his 1967 *Voyenno-istoricheskiy zhurnal* article Batitskiy presents a fairly standard overview of VPVOS history, but in his closing comments on the post-war situation he suggests that the tasks and role of the VPVOS have grown to incorporate "repelling the air-cosmic (aerospace) nuclear attack of the enemy" and ensuring the survivability of the nation. To do this the PVO must be deployed throughout the depth of the nation and it must qualitatively increase its combat effectiveness to become impenetrable.[108] This formulation appears to argue for the joint development of air, space, and missile defense forces while not specifically mentioning PRO.

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107 Batitskiy (1967a; 6).

108 Batitskiy (1967a; 26).

But while Batitskiy was hinting at the integration of aerospace forces in his public statements, in his classified arguments he was very direct about his plans. These arguments are presented in his 1967 *Military Thought* article that sets the stage and the agenda for the rest of the pre-ABM treaty period.

The first part of Batitskiy's article is a largely non-critical story of the development of PVO, from World War I to the present. The description of the Great Patriotic War emphasizes the development of the anti-air operation, noting that the defense of Moscow showed the characteristics of such an operation.[109] Batitskiy points out that the operational art developed during the Great Patriotic War was maintained during the 1950s as the basic PVO means had not changed.[110] However, the appearance of new weapons, such as the ICBM, has demanded further development of operational art:

> Such operations (such a concept is introduced by us as a definition) will be characterized by a spatial sweep [sic] the participation of a considerable number of troops, the decisiveness of objectives, high tension [intensity], fluidity and aggressiveness of combat actions, and the broad application of operational maneuvering. They would consist of separate operations, attacks and battles of the troops of the antiaircraft, antimissile and anti-space defense. Along with the operations and in the intervals between them the PVO troops would carry out daily combat actions.[111]

The aerospace defensive operation is presented as the modern counterpart to the Great Patriotic War's anti-air operation, and is clearly an extrapolation from it. Batitskiy's article unequivocally places the

109 Batitskiy (1967; 33).
110 Batitskiy (1967; 38).
111 Batitskiy (1967; 39).

integration air, space, and missile defenses at the top of the priority list of the VPVOS.[112] As in his *Voyenno-istoricheskiy zhurnal* article, it is clear that the viability of the defensive operation can only be ensured by combining all PVO elements, and deploying them nationwide with centralized command and control. Thus, within a year after assuming the leadership of the VPVOS, Batitskiy had staked out a strongly pro-PRO position and placed the aerospace defensive operation at the heart of the VPVOS's operational art. Rather than introducing a new concept, though, Batitskiy emphasized the link to the anti-air operation, portraying the aerospace defense mission as a logical extension required by new technology rather than a departure in a new direction. This suggests incrementalism in the development in operational art, as well as an attempt to sell the program as an evolutionary, rather than revolutionary, development in armaments.

The introduction of aerospace doctrine in *Military Thought* was echoed by the introduction of the new catch phrase "aerospace" (or air-space) on the editorial pages of *Vestnik PVO*. After Batitskiy's first use of the phrase, editorials began to refer not just to air attack but to air-space means of attack, with the obvious corollary that the VPVOS must be able to defend against them. This phraseology continued throughout 1967 and 1968.

Batitskiy's enunciation of the aerospace defense operation was taken up by Colonel Ye. Kalugin in the January 1968 issue of *Military Thought*.[113] Kalugin describes the aerospace defense operation in detail,

112 Batitskiy's article appeared while the Moscow ABM system was under construction, apparently just after an acceleration in work on the system and just before its completion. See Stevens (1984; 200-201).

113 Kalugin (1968).

noting that while the basic principles developed in the Great Patriotic War still hold, nuclear weapons have greatly complicated the defense's job. Particular areas of overlap between the Great Patriotic War and the nuclear era are the importance of surprise and first strikes, massing of forces, and concentration of efforts against the most important objectives. The differences from the Great Patriotic War are the increased range of offensive weapons, threatening the entire country, and the emphasis on strategic targets rather than ground support.[114]

The greatest threat is during the first few hours of the war, when phased attacks by ballistic missiles and aircraft are expected, with subsequent attacks by remaining forces.[115] In terms of attrition requirements Kalugin presents the rather unusual argument:

> On the whole, the effectiveness of combat operations must be extremely high because at least all the carriers of nuclear weapons must be destroyed in order to repulse a strike of the aerial enemy against defended objectives. In the period of World War II it was sufficient to shoot down or damage 20-25 percent of the attacking aircraft in order to achieve this.[116]

This ambiguous statement is worth examining. First, it seems to imply that all nuclear carriers must be destroyed, and second it suggests that 20-25% attrition rate was sufficient to repel a strike. Judging from other VPVOS comments along these lines, Kalugin appears to be arguing that a 20-25% attrition rate is *too low* under modern conditions and that rates much closer to 100% must be achieved. It should be noted, however, that

114 Kalugin (1968; 43).

115 Kalugin (1968; 44).

116 Kalugin (1968; 47). This work is only available in translation and it is possible that much of the ambiguity is due to the quality of translation.

even rates of 20-25% are much higher than usually achieved in the Great Patriotic War and are even higher than most other VPVOS estimates of the attrition achieved during that war.[117] This suggests that Kalugin was endorsing a lower "floor" on the effectiveness of the VPVOS or perhaps arguing that at this rate the attacking force would break off the operation. As Kalugin seems to admit, however, such a response seems unlikely in modern conditions. Furthermore, in the case of ICBM RVs there is no "breaking off" of the attack, so Kalugin's article also sets a minimum requirement for PRO effectiveness as well.

PRO is discussed extensively by Kalugin, particularly the various technical aspects of interception and systems for accomplishing the task. Although he makes no comments about its potential effectiveness the tone of this section is rather optimistic.[118] On the question of PRO command and control, Kalugin argues that a single command post must coordinate the actions of all services and branches participating in the aerospace defense operation.[119] However, the need for a partial decentralization of control is also recognized, as events might move too rapidly for centralized control (even highly automated) to react, or in the event that communications are disrupted.[120]

Kalugin's article is one of the most detailed and comprehensive outlines of the aerospace defense operation. It clearly represents a step forward in VPVOS operational art, although the influence of historical experience and principles is clear.

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117 Thus Biryuzov (1961; 26) gives a figure of 5-10% in a comparable argument.

118 Kalugin (1968; 47-51).

119 Kalugin (1968; 51).

120 Kalugin (1968; 51-52).

These articles, when combined with past VPVOS work on operational art, outline an operational concept for the VPVOS oriented towards an integrated air and space defense employing PVO, anti-satellite and PRO forces. But Batitskiy's advocacy did not win the day. During the 1967-68 period other top military officers expressed their opposition to the PRO program in veiled terms. Thus the Commander in Chief of the SRF, and the Commander of the Civil Defense program both made statements critical of PRO, as did the new Minister of Defense, Marshal Grechko.[121] While the opposition's public arguments were not as explicit or detailed as those of the VPVOS the main point of the debate again appears to have been the expected effectiveness of the PRO system.[122]

The decision to engage in arms talks with the U.S., announced in June 1968 appears to have signalled the end of the debate over PRO by indicating Soviet willingness to negotiate on defensive as well as offensive arms.[123] At about the same time construction work at two Moscow ABM sites

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121 Warner (1977; 152), Garthoff (1984; 298-99). Deane (1980; 34-41) argues that there was not a debate, but rather that the limited effectiveness of PRO was recognized by all parties and that the implication was that it would have to be used in conjunction with a first strike and civil defense. While the latter is a reasonable conclusion, Deane's argument on the former is rather obscure, resting on the fact that some earlier statements had also expressed reservations about PRO effectiveness. This could just mean that the debate over effectiveness started before 1967, as is indicated in the Aleksandrov--Plyachenko exchange examined above.

122 One aspect of this debate that has not been examined in detail is different ways of attaining damage limitation--SRF first strike versus VPVOS defense. On this topic it is interesting to note that I.I. Anureyev published an article in *Military Thought* in 1967, that presents a simple strategic forces model that incorporates both counterforce against EMT targets and some provisions for defensive attrition. Such a model would provide for modeling of the tradeoffs between defensive and offensive damage limitation. See Anureyev (1967) and for a detailed examination and application of the model see Meyer (1983-4; 38-44).

123 Garthoff (1984; 299).

was halted.[124]

Garthoff notes that the decision to engage in talks was accompanied by a decrease in references to PRO in 1968 and that the 1968 November parade omitted for the first time a reference to PRO missiles, and such references haven't been made since.[125] Batitskiy's editorials also began to omit references to PRO or aerospace defense.[126] Indeed, after November 1967 explicit references to Soviet PRO systems in *Vestnik PVO* disappears until one or two brief comments in the early 1970s.[127]

During the years leading up to the ABM Treaty, and shortly thereafter, there were continuing signs of VPVOS displeasure with the decision to negotiate on PRO. First, while explicit references to PRO were expunged from the editorials in *Vestnik PVO*, authors continued to refer to aerospace means of attack, even though they only discussed defense against air attacks. Thus, the threat of missile attack was recognized while the limitation of the VPVOS to only defending against air targets was subtly alluded to.[128] This pattern continued throughout 1968 and into early 1969 with occasional references also appearing in articles on ideological themes.[129] In early 1969, however, the use of the phrase again changes, with some authors noting that the VPVOS has the capability to both observe and defend against aerospace attacks.[130] By mid-1969 these references

124 Freedman (1986; 90).

125 Garthoff (1984; 300). Ghebhardt also notes a disappearance of discussion of PRO. Ghebhardt (1975; 108).

126 Batitskiy (1970), (1971), (1972c), (1974), (1975b).

127 "Partiya--nash rulevoy". (1967; 6).

128 See the unattributed editorials in the February and April 1968 issues of *Vestnik PVO*, "Pyatdesyat geroicheskikh let" (1968) and "Byt' bditel'nymi" and Grishkov (1968a; 4).

129 See Golubitskiy (1968; 8), Yakushkin (1968; 12).

130 Golikov (1969; 11), *Vestnik PVO* (1969; 6).

disappear and the only (with one interesting exception) use of the term aerospace occurs in a July editorial by Batitskiy.[131]

What is the significance of these changes in phraseology? The most reasonable explanation is that the term "aerospace" was directly linked to the concept of the aerospace defense operation, incorporating PRO and anti-satellite missions. By using this phrase, the VPVOS leadership could continue to maintain its position in favor of PRO and anti-satellite missions by emphasizing that the threat was aerospace while the response was being limited to air defense. The disappearance of this phrase from regular use in 1969 suggests two possibilities: either the VPVOS leadership was ordered to cease using it in order to end their continuing expression of dissent or to placate the U.S. in its negotiations. It is unlikely that it was done to placate the U.S. as the latter was more concerned with ABM construction than VPVOS phraseology, suggesting that the General Staff or the civilian leadership clamped down on open VPVOS advocacy. Nevertheless, the VPVOS managed to make its position known, and the phrase even reappears in the unclassified literature briefly in 1971.

Several articles published in the early 1970s provide the clearest evidence of VPVOS concern about the ABM Treaty. First, as Deane points out, at approximately the same time (March 1971) as the USSR proposed its draft treaty on ABM limitations two articles featuring the banished phrase "aerospace defense" appeared in *Vestnik PVO*.[132] In the lead (unsigned) editorial celebrating the upcoming Party Congress it is noted that the VPVOS, together with the other services and Warsaw Pact forces has the

131 Batitskiy (1969; 11).
132 Deane (1980; 52-55).

task of reliably protecting the socialist countries from nuclear strikes and all means of air-space attack of the aggressor.[133] In the very same issue, though, in a quasi-editorial Batitskiy ignores the question of PRO and air-space attack, instead stressing the danger of surprise attack, and referring to the need to preserve the impregnability of the Soviet air borders and to carry out the assigned tasks.[134]

A third article in the March 1971 issue of *Vestnik PVO* also makes an argument for PRO. Lieutenant General G. S. Legasov, in an article examining the contributions of Soviet science and technology to the national defense, again notes that the VPVOS role is to defend against air-space means of attack. Continuing, Legasov claims that the VPVOS "has today" arms able to observe, track and destroy air-space targets.[135] This statement goes much further than any other in the VPVOS press during this time period. It may be intended as an indication that the Moscow ABM system had just become operational, but such an explicit indication would be very unusual for the Soviet press. Rather, it is more likely that Legasov is pointing out that the technology for PRO is ready, and that it is other (i.e. political) considerations that are preventing its full exploitation.

This cluster of articles in one issue of *Vestnik PVO* is rather unusual and certainly was not a coincidence. It would appear a last-minute effort to stake out the PRO issue for the VPVOS. It is surprising that

133 "Pod rukhovodstvom partii--k novym pobedami!" (1971a; 5).

134 Batitskiy (1971; 8, 11, 14). The article is a "quasi-editorial" in that it has the content and format of an editorial but appears just after the "official" editorial.

135 Legasov (1971; 79). Legasov's position is not known, but he does appear in an obituary of a VPVOS officer associated with the Sary Shagan PRO test site, suggesting that he may have had direct ties to the PRO program.

Batitskiy avoided the issue in his article, but the issue might have been too sensitive (since it had already been decided) for a top-ranking officer to address. Even though the unsigned editorial would have been approved by Batitskiy the etiquette of advocacy might have precluded a public challenge to a Party decision and the risk of a charge of "factionalism."

The second major indication of VPVOS discontent is an article by Zimin, at the time head of the VPVOS command academy.[136] Zimin's article was published in the "In Foreign Armies" section of *Vestnik PVO* in August 1971, when a tentative agreement between the U.S. and the Soviet Union on ABMs had already been reached.[137] Not only is it unusual for a high-ranking officer to write an article in this section, but its length and topic are also unusual. Zimin presents an overview of the development of air defense (PVO) in the postwar period, stressing PRO equally as much as antiaircraft defense. The implication is that PVO should include both air and space defense, and Zimin explicitly refers to aerospace means of attack. Furthermore, in concluding his article Zimin makes a strong argument for future work in PVO including defense against aerospace attack, and suggests that the importance of PVO is increasing rather than decreasing.[138]

The strength and nature of Zimin's arguments indicates why the article was placed under the "In Foreign Armies" section: such a strong argument could not be presented in a discussion of Soviet policy where even

136 Zimin (1971).
137 Garthoff (1985; 146-7).
138 Zimin (1971; 82).

the use of the phrase aerospace was disallowed. By placing the argumei in terms of U.S. actions and intentions, coupled with general objective trends in air defense, Zimin was able to make his point without directly contradicting Party and government policies.[139]

Other indications of concern with the imminent ABM treaty appeared in the military press. In May 1972 (the same month the ABM treaty was signed), a review of a book on PRO by I.I. Anureyev, a prominent officer at the General Staff Academy, appeared in *Military Thought*. While Anureyev's book is generally pessimistic about the current feasibility of PRO, and is particularly critical of its cost-effectiveness, the reviewer, Major General Provorov, instead emphasizes the importance of aerospace defense, playing up the positive aspects of PRO while passing over the problems.[140] The author ends by noting Brezhnev's comments on the need to respond to attempts to gain military superiority over the USSR.[141] This very pro-PRO review is one of the last clear arguments presented in favor of PRO. Conversely, the review of Anureyev's book in *Vestnik PVO* is bland and non-critical, as the reviewer studiously avoids the use of the term aerospace or any endorsement of PRO.[142] This reversal of roles between *Military Thought* and *Vestnik PVO* is consistent with the clampdown on pub-

139 Zimin was promoted to Marshal in 1973, so his advocacy does not seem to have signifcantly harmed him personally. See Akhromeyev (1986; 277).

140 Provorov (1972; 124), Anureyev (1971; 117-126, 193-99). Provorov's position is unknown. He may be the same person who co-authored the *Sovetskaya voyennaya entsiklopediya* (1976; 255-56) entry on military-educational institutions, indicating either a General Staff position overseeing academies or a position in one of the academies. Provorov also signs an obituary for G.S. Fedorenko (*Krasnaya zvezda* March 14, 1969, p. 4) but since Fedorenko was associated with both the General Staff Academy and the VPVOS this can't determine Provorov's position unambiguously.

141 Provorov (1972; 125).

142 Gorbatenko (1971; 94-95).

lic advocacy of PRO development. It appears that it was decided to keep explicit discussion of PRO at a classified level. Certainly, the most significant pronouncements and debates took place in *Military Thought*, reflecting its high-level and all-service nature.

Further evidence that the VPVOS had not abandoned plans for aerospace defense is found in an article by Batitskiy published in *Military Thought* in late 1973. By this time the ABM Treaty was an accepted reality, but in looking at future trends Batitskiy noted that "We can expect...air defense troops will become firmly established as aerospace defense troops (missile defense, defense against space weapons, and antiaircraft defense)."[143] This reiteration of the aerospace defense concept suggests that it was not renounced in 1969, but that it was not to be discussed in the open literature. Batitskiy went on to examine the role of PRO more explicitly, noting that MIRVs will increase the offensive potential of ICBMs but that PRO development would have to be qualitative and limited to the capital due to the ABM treaty.[144] Thus, Batitskiy appears to have accepted the ABM Treaty limitations while still maintaining his argument that the VPVOS would develop PRO and anti-satellite missions. To some extent this path was followed as anti-satellite development continued, albeit slowly, during the 1970s and the Moscow system was subjected to the "qualitative development" noted by Batitskiy.[145]

After the early 1970s all references to PRO and aerospace defense disappear from *Vestnik PVO*, and *Military Thought* is unavailable after

143 Batitskiy (1973b; 42).
144 Batitskiy (1973; 42-43).
145 Department of Defense (1987; 46-51).

1973. All indications are that the VPVOS continued to develop PRO technology, as well as maintaining and upgrading the Moscow ABM system. However, no discussions of the desirability of defense appeared until the early 1980s, when U.S. proposals for defense of MX, and later the SDI program, forced the issue back onto the public agenda. VPVOS reactions to these developments are discussed in a later chapter.

While the VPVOS suffered a setback in the debate over PRO there was some compensation in the anti-satellite field. The decision to seek an agreement limiting PRO systems did not mean an end to Soviet interest in the military use of space, nor the total abandonment of the VPVOS's concept of aerospace defense. In late 1968 two apparently successful tests were conducted of a satellite interceptor (anti-satellite--ASAT), the first in a series of tests that was to continue off and on until 1981.[146]

5.4.4 Analyzing the PRO Debate

There are several important features of the PRO debate that provide insight into the Soviet defense decisionmaking process. Unlike the development and deployment of more traditional weapons like the MiG-25 and SA-5, the PRO system raised questions that transcended the narrow responsibilities of the VPVOS. Issues of strategy and doctrine were affected by the PRO deployment decision, and accordingly the decisionmaking process involved all levels of the political and military leadership. This case therefore provides a good opportunity for assessing the interaction between the levels.

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146 Satellite data is in Freedman (1977; 19), Berman and Baker (1982; 150-153). For an overview of ASAT development and negotiations see Hafner (1980/81).

At the level of the political leadership there appears to have been serious debate over the advisability of PRO in the politburo.[147] While the details of coalitions and decisionmaking at this level are not clear, it is clear that the earlier strong endorsement of PRO under Khrushchev had disappeared. The decision to engage in negotiations on the limitation of both offensive and defensive weapons indicates that a high-level decision was taken in 1968 to pursue ABM limitations.[148] As noted above, the great expense associated with the construction of a nation-wide PRO system must have been a major contributing factor to the urgency of the debate.

The lack of consensus at level 1 appears to have provided the opportunity for debates at the lower levels of the decisionmaking structure. During the advocacy and agenda-setting phase the various services and the General Staff presented their views in a public debate, but once the Politburo decision was made in 1960 the public debate disappeared. Implementation of this decision took two directions. First, there was the initiation of the SALT talks, which fell outside the purview of the VPVOS. Second was the decision to complete and maintain the Moscow ABM system. This part of the implementation the VPVOS appears to have carried out successfully. As we have seen, though, the issue of PRO did not completely disappear, and VPVOS advocacy appeared for some time after the decision, although either in surrogate arguments or classified publications. The VPVOS thus appears to have been unwilling to allow the PRO issue to completely disappear from the defense agenda, as the 1973 comments by Batitskiy and the later upgrades to the Moscow ABM system indicate.

147 See Parrott (1987; 24-25), Garthoff (1984; 295-300).
148 Garthoff (1984; 299-300).

Let us consider the constellation of views and opinions at level 2.[149] It appears that as the technical limitations of the ABM system became clearer (particularly in comparison with U.S. systems) and its resource-allocation impact on the other services mounted, that opposition to PRO from the other services increased.[150] As outlined in the previous section there was considerable disagreement amongst high-level military officers over the value and feasibility of PRO. The debate was not over whether PRO would contribute to deterrence, but rather whether it would be effective and cost-effective. Had a highly effective defense been possible at a reasonable cost it is most likely that the military leadership would have supported it.

This dissent amongst the military leadership at level 2 devalued the military monopoly on defense information as the lack of a consensus on PRO effectiveness presented the political leadership with varying assessments and information, rather than an agreed-upon military position. The key to this split is the fact that both the Strategic Rocket Forces and VPVOS had extensive experience in assessing PRO systems: the SRF in planning future systems to penetrate proposed U.S. systems, and the VPVOS in planning its own. The existence of strong advocates of offense and defense schools within the Soviet military produced varying estimates of PRO effectiveness, and provided General Staff analysts and the political leadership with a great deal of additional information and opinions.

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149 This material on the various positions of institutional players is drawn from the analyses of Holst (1969), Wolfe (1970), Ghebhardt (1975), Stevens (1984), Garthoff (1984) and Parrott (1987). The analysis presented here differs in that I emphasize the interaction between levels and the importance of VPVOS institutional interests and operational art in establishing its bureaucratic position.

150 This is reflected in the 1968 debate described above.

In addition to the competition between services, there was a great debate raging in U.S. military, industrial, and academic circles concerning the effectiveness of ABM systems. This debate would have been difficult to ignore even for the advocates of PRO, and some commentators suggest that the Pugwash conferences involving Western academics and some Soviet military representatives may have contributed to growing Soviet doubts about PRO.[151]

Differing assessments and estimates of PRO effectiveness were therefore available to the civilian and military leadership from both Soviet military sources and Western civilian and military sources. These assessments both resulted from, and contributed to, the relatively open debate over the value of PRO. Without such an open information flow the range of information and ideas available to both the General Staff and the civilian leadership might have been much more restricted and the possibility for organizational biases and influences might have increased.

Another element that should be considered in examining of the debate over PRO is the impact of the Vietnam war. While superficially unrelated and separate, the war appears to have acted in an unexpected way on the decisionmaking process. While the Vietnam war might have been expected to strengthen the hand of those opposed to any negotiations with the U.S. it had a greater countervailing impact on the VPVOS's institutional credibility. As shown in the next chapter, the performance of SAMs in Vietnam did not live up to the expectations of the VPVOS. This failure to accurately assess the capability of a new PVO technology must have

151 Garthoff (1984; 293-4,308) notes the participation of Col. Gen. Gryzlov at a Pugwash conference in 1967 and the general value of the exchanges.

reflected poorly upon the VPVOS's assessments of PRO technology, which was even less tested than the SAMs. By discrediting the VPVOS's assessments, therefore, the poor SAM performance may have weakened the VPVOS's arguments for PRO addressed to the military and political leadership. Furthermore, the ongoing measure-countermeasure game in Vietnam between the PVO and the USAF may have served as a strong reminder of the continual struggle between defense and offense, a struggle that could prove quite costly.

Finally, at the service level (Level III) we find both advocacy and incrementalism. In developing the concept of aerospace defense, the VPVOS resorted to the typical organizational approach of incremental innovation.[152] Rather than presenting PRO as a new activity with new demands on operational art and tactics, the old concept of the anti-air operation was stretched to fit the new technology. Both Batitskiy's and Kalugin's articles treat nuclear warfare in a framework derived from the Great Patriotic War, considering massed, phased attacks, with prolonged combat and extensive use of maneuver. There is little explicit attention given to the great difficulties and peculiarities of operation in a nuclear environment, and the entire conceptual framework is drawn from conventional operations. For example, the comment that at a certain attrition rate the attacker may break off the attack seems tied to the old concepts of formation flying and bombing and seems ill-suited to a nuclear war where the attacking crews may well realize the importance of their mission, the fact that there are no second chances, and the possibility that they may have nothing left to go back to. Even if very high attrition rates of 20-25%

152 See the discussion in Chapter 2.

could be achieved causing some forces to break off the attack for an overall penetration rate of only 50%, the question arises whether this attrition level is sufficient to make a substantial difference to the damage inflicted on the Soviet urban-industrial structure.

These questions are not even hinted at in either Batitskiy's or Kalugin's article, both of which implicitly assume that defense is feasible and that the war will continue past the first volleys of missiles. In this case then, we see military officers looking at the conduct of nuclear war in a manner quite different from that of Western civilian analysts.[153] The enunciation of the aerospace defense operation is representative of this extension of conventional concepts to deal with nuclear war. But the aerospace defense operation also had a political significance by allowing the VPVOS to argue for continued PRO support as part of an integrated mission plan. This is not to say that the aerospace defensive operation was a fiction designed to impress the political or military leadership, but it allowed the consolidation of all VPVOS missions into one package that demonstrated their synergy.

The PRO debate involved wide disagreement over the proper evaluation of the effectiveness of the system, and the differing assessments had very broad policy implications. The military consensus emerging in the late 1960s (excepting the VPVOS) did oppose the extensive development of PRO. This came about in spite of the advocacy of the VPVOS, and was an important element in the decision to start the SALT negotiations. But while

153 Deane (1980) makes this point throughout his monograph, but makes it too strongly and does not seem to allow for differences between the military and political leadership on the desirability of deterrence as opposed to active defense.

the VPVOS engaged in advocacy in accord with the organizational politics model, this case also indicates the limitations of the organizational politics model. Thus, the issue was elevated to the top political leadership and decided there, not at the intermediate levels of the structure. At level 1 the main decisionmaking dynamic was largely unrelated to the advocacy of the VPVOS: once the arguments for and against PRO had been made the decisive factor was the political power of the factions. While the strong military opposition to PRO on the part of the other services and the General Staff was a necessary condition for entering negotiations it was not sufficient, for the decision lay with the political leadership.

Taken together, the factors listed above point strongly to the decision to prevent the development of a PRO race. The prospective cost and low effectiveness seem to have combined with military considerations to create a strongly majority opposed to the program in both the military and political leaderships. In this debate the VPVOS clearly lost, but at least the prospect of continued research programs and future potential for deployment was offered as a consolation prize.[154]

5.5 Summary

During the period surveyed here we can see good evidence of the applicability of the organizational politics model and its limitations. In describing the internal behavior of the VPVOS the model appears to fit quite well.

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154 Parrott (1987; 32-33).

First, the VPVOS appears to have continued to overestimate the effectiveness of its forces until at least the late 1960s when data from Vietnam began to come in. Even then, however, there were hints of overestimation of their forces when used in a strategic defense role by Soviet soldiers.

Second, many of the weapons delivered to the VPVOS do not seem to have been well-optimized to meet the threats they were facing. While the SA-5 and MiG-25 may have been designed according to a "rational analysis" of the threat, this analysis was premised on inaccurate assumptions concerning the future direction of the air threat. Once these weapons were under development and deployment the VPVOS, instead of redesigning or canceling them, appears to have assigned them new missions to which they were less well suited, but which served to justify their use and opened up the possibility of further improvement.

Third, in the case of PRO there are clear indications of organizational interests, advocacy, and incremental innovation. These manifested themselves in the VPVOS positions on the cost-effectiveness of PRO systems and in the expansion of old concepts such as the anti-air operation to incorporate the new technology and threat. Overall then, the evidence indicates that an organizational politics model provides more insight into VPVOS behavior during this period than a more restricted rational actor model.

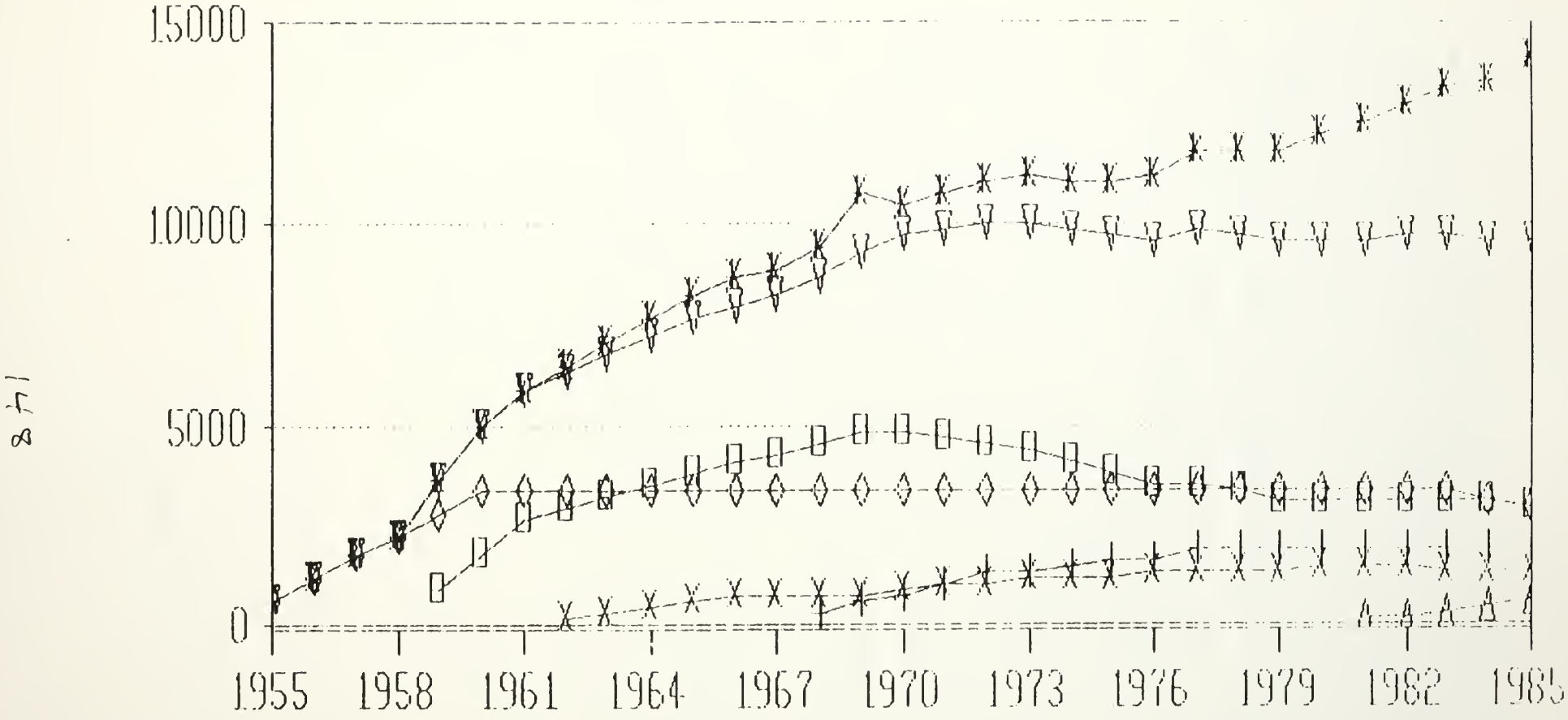
The limitations of the organizational politics model are also clear, for despite the fact that the VPVOS engaged in advocacy for its interests, the decision rendered was unfavorable. Thus, we run into the real limits of the model: the service's power is constrained by that of the General

Staff and the political leadership--the service may advocate its positions but this advocacy may only be undertaken before the decision is made, and may be severely restricted both before and after the decision stage. In contrast to services in the U.S. the Soviet services are unable to choose the forum for debate or to continue strong protests after a decision has been rendered. The most they can hope for is to maintain the issue on the agenda and hope that an opportunity to re-examine the issue arises at a time more favorable to their interests.

While the VPVOS increased the capability of its forces during the 1960s and branched into PRO and anti-satellite missions, by the end of the decade its ability to carry out its missions was in doubt. Despite the large investments in air defense equipment the consensus of most Western analysts was that the VPVOS could do relatively little to blunt a U.S. bomber attack and certainly could not save the USSR from destruction. Furthermore, as discussed in the following chapter, Vietnam and the 1967 Arab-Israeli war had demonstrated even to the Soviets that their air defenses might not be as strong as they had expected. Given these developments the loss of the PRO mission must have cast serious doubt on the future of the VPVOS.

Soviet Strategic SHH Rails and Launchers

FIGURE 5.1



Sources: Wright (1986).

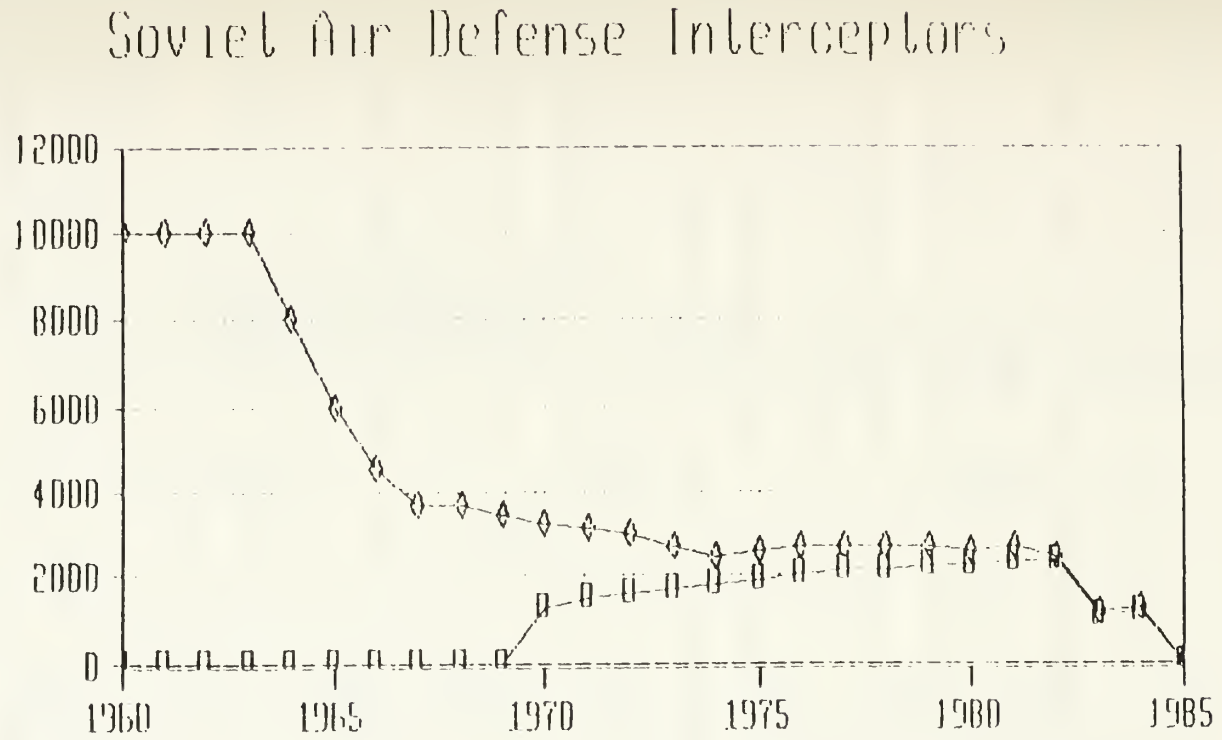
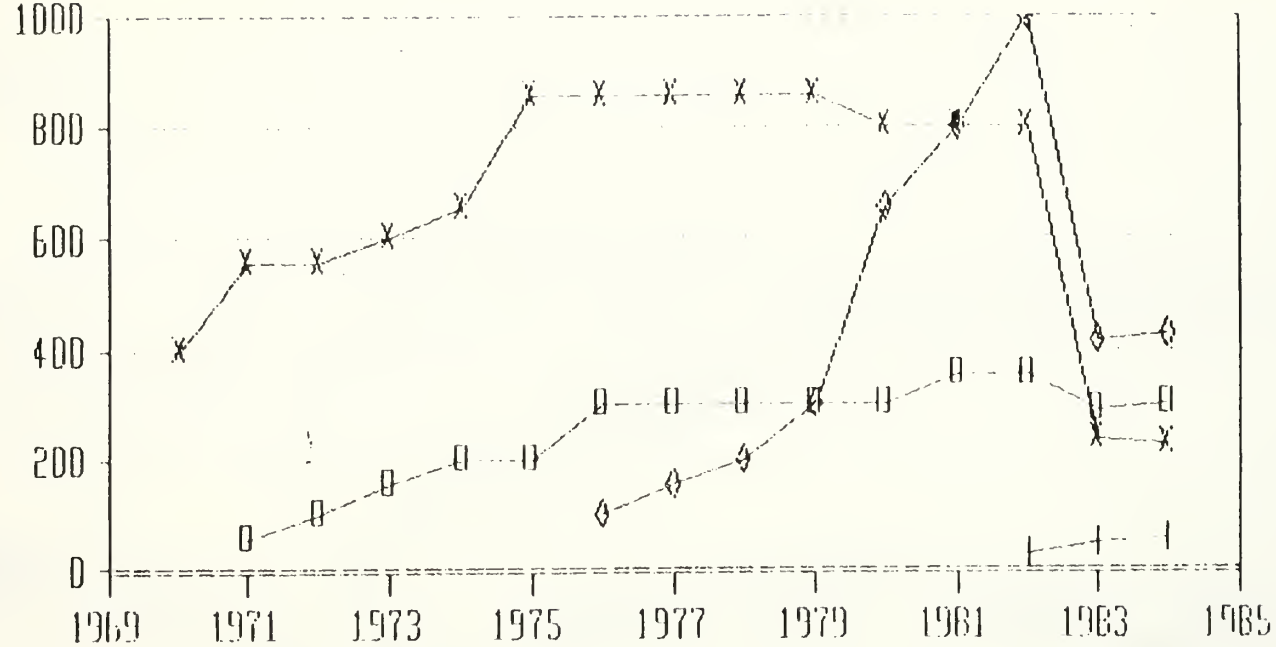


FIGURE 5.2

Source: International Institute for Strategic Studies (1960-1985). The Military Balance. London: International Institute for Strategic Studies.



Source: International Institute for Strategic Studies (1969-1985). The Military Balance. London: International Institute for Strategic Studies.
Collins (1978), (1985).

CHAPTER 6

THE 1970S: REDEFINING THE VPVOS

6.1 Introduction

The signing of the ABM treaty was an important turning point for the VPVOS, as well as for Soviet defense policy as a whole. For the VPVOS as an organization the ABM treaty presented a number of problems. Prior to the treaty the possibility still existed that a workable PRO system would be developed and deployed to create a complete strategic defense system. The denial of this possibility left the VPVOS with its air defense (PVO) and anti-satellite missions but weakened the rationale for these missions. While the U.S. bomber force remained a formidable opponent and carried a significant fraction of U.S. total warheads and equivalent megatonnage (EMT), the lack of an ability to defend against the other threats raised the issue of whether a defense against bombers was a sensible and cost-effective use of resources. Furthermore, the relatively poor performance of VPVOS equipment and tactics in Vietnam (particularly during the Christmas bombing of 1972) raised questions about the feasibility of effective strategic air defense.

In the context of a slowly changing military strategy, renewed emphasis on conventional warfare, and with its main mission hampered by the lack of PRO, the VPVOS and the General Staff re-evaluated the VPVOS's roles and missions. The results of this reappraisal, conducted in the early 1970s, was a new emphasis on PVO under conditions of conventional

warfare, and particularly defense of Warsaw Pact lines of communication (LOCs, e.g. railroads, bridges, transfer points). This reorientation allowed the VPVOS to maintain its primary mission of homeland defense while committing its forces to a mission in support of the conventional warfare plans being drafted by the General Staff.

At the same time the VPVOS was trying to absorb the lessons of combat experience in Vietnam and the Middle East in order to further develop its tactics and operational art for theater warfare in Europe. In assimilating these lessons, however, the VPVOS revealed a number of organizational preconceptions and biases that hampered its learning behavior.

Overall, the 1970s were a period of adjustment for the VPVOS as the PRO mission disappeared and as resources were shifted to conventional warfare programs and away from the VPVOS. Nevertheless, the VPVOS retained a large force and sustained a large modernization program.

6.2 VPVOS Reaction to the ABM Treaty

The VPVOS reaction to the signing of the ABM treaty was rather muted. The only official comment in *Vestnik PVO* was an editorial by General Lieutenant N. Grishkov, the Deputy Commander for Combat Readiness, entitled "Strengthen the Might of the PVO."[1] This editorial is an unusual mix of politics and exhortation to greater efforts at training. Grishkov first notes that the VPVOS plays an important and growing role in the defense of the nation, then proceeds to paint a harsh picture of the imperialist threat. Brezhnev is cited to the effect that the USSR requires a reliable defense and increased defense capacity. After pointing out the

1 Grishkov (1972).

aggressiveness of the enemy, Grishkov goes on to endorse the May 1972 plenum (at which Brezhnev's foreign policy and the prospective treaties were discussed) and the agreements reached between the U.S. and USSR.[2] But the endorsements are rather formalistic, and Grishkov does not even mention the names of the agreements, let alone their contents. Nowhere is it mentioned that limitations were placed on PRO deployment or on offensive strategic arms. This omission was not due to security concerns, for the agreements were published on the front page of *Krasnaya zvezda*.[3] When put in the context of the opening of the article, Grishkov's statement seems almost a *pro forma* endorsement of the treaty, combined with an argument that the defenses of the USSR must be retained and strengthened.

From his discussion of politics Grishkov moves to the need for greater training and higher combat readiness. Here too, he raises some new and important issues. Grishkov notes that the criteria of combat readiness have essentially changed and then cites Minister of Defense Grechko to the effect that: "the Soviet Armed Forces must be able under all conditions to thwart the surprise attack of an aggressor using either nuclear or conventional weapons."[4] This explicit comment about the need to prepare for both conventional and nuclear conflict is unprecedented in *Vestnik PVO* and marks an official turning point from a nuclear to a mixed nuclear and conventional role for the VPVOS.

The rest of Grishkov's editorial is devoted to training problems, emphasizing that the VPVOS must increase its efforts in this field in or-

2 Grishkov (1972; 2-3).

3 The text of the two agreements is given in *Krasnaya zvezda* May 28, 1972 pp. 1,3.

4 Grishkov (1972; 4).

der to strengthen the PVO overall. While Grishkov's discussion of the problems in the training process is quite open and critical, the material is not very new or significant.[5]

What kind of missions would the VPVOS fulfill in the course of a conventional war? The answer to this question was given in a two-part *Voyenno-istoricheskiy zhurnal* series by Batitskiy on the VPVOS during the Great Patriotic War.[6] While these articles contain no great surprises they do stress the role of the VPVOS in LOC defense, particularly during the first period of the war.[7] Batitskiy points out that the defense of LOCs and objects in the rear of the fronts was "no less important" a mission than the defense of administrative-political centers, which seems to accord this mission a greater priority than other authors.[8] Furthermore, in his opening definition of the roles and missions of the VPVOS during the Great Patriotic War, Batitskiy notes that "in cooperation with the front air forces and troop PVO, [the VPVOS] successfully defended from air

5 Most of the other services appear to have ignored the summit meeting and the agreements, devoting most of their editorial space to the upcoming 50th anniversary of the (first) Soviet constitution. Perhaps the VPVOS felt required to respond to the agreement since it directly concerned the service and its missions. Only in *Voyenno-istoricheskiy zhurnal* were the agreements mentioned, in a December editorial by Minister of Defense Grechko. Grechko endorses the agreements fairly strongly, noting that they lessened the threat of nuclear war, and limited the arms that are the most destructive and the most expensive. See Grechko (1972; 12). In comparison to the passing mention of the agreements in *Vestnik PVO*, Grechko's endorsement is much stronger and clearer. (This is based on a scanning of the service journal editorials and quasi-editorials from April 1972 to December 1972. In particular, *Voyenniy vestnik*, *Aviatsiya i kosmonavtika*, *Morskoy sbornik* (issues 5, 8, 11 --the only ones available), and *Military Thought* issues 6, 8, 11, 12.)

6 Batitskiy (1972a,b).

7 Compare the treatment of the first period presented in Batitskiy (1972a) to that of Batitskiy (1967).

8 Batitskiy (1972a; 17), (1972b; 28).

strike important administrative-political centers, industrial regions, frontal objectives and communications."[9] While this definition of roles and missions is not a great departure from previous statements, it does place the two missions on equal footing, and the prominence of the statement indicates that it is not an offhand comment.[10]

Batitskiy finished the year with an article in *Vestnik PVO* on the occasion of the 50th anniversary of the creation of the Soviet State.[11] The broad topic of this article gave Batitskiy the opportunity to discuss the international situation, as well as the need to increase combat readiness within the VPVOS. Batitskiy delivered a fairly harsh attack against the West, stating that the current lessening in tensions does not mean that the threat of imperialism has been averted. The SALT agreements are ignored and the image of a tough, aggressive adversary is presented.[12] But despite a general call to strengthen the VPVOS, Batitskiy did not make any new comments or suggestions as to the roles and missions of the VPVOS.

The most authoritative statement on the changing role of the VPVOS was published in *Vestnik PVO* in April 1973 by General Kulikov, the Chief of the General Staff. Kulikov's article is extremely unusual: it is the only instance of a General Staff (or any other Ministry of Defense) official writing an editorial in *Vestnik PVO* in the twenty year period examined.[13] Kulikov's editorial thus marks a major departure from the norm,

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9 Batitskiy (1972a; 14).

10 For comparison see Yerofeyev (1970; 20), (1971; 93). Note however that these articles may even reflect the beginning of the new stress on LOC defense. The *Voyenno-istoricheskiy zhurnal* articles appear to be the first time Batitskiy explicitly accorded these two missions equal status.

11 Batitskiy (1972c).

12 Batitskiy (1972c; 7-8).

13 The only similar occurrence was an editorial by the Politburo member and General Secretary of the Moscow City Party Committee, Grishin in 1970, marking the twenty-fifth anniversary of the end of the Great Patriotic War. Grishin's article, in contrast to Kulikov's, barely mentioned the

and its title, "PVO in the System of Defense of the Soviet State" also indicates a higher-level view of the roles and missions of the VPVOS.

Kulikov's editorial treads a fine line between praising the arms control accomplishments of the Brezhnev regime and presenting an imminent imperialist threat. In so doing he stresses the need for a strong defense as well as efforts to reduce international tensions.[14] Turning to the VPVOS, Kulikov defines its role in several ways. First, he notes the need to protect the national territory: cities, important economic centers, population centers and groups of forces and the fleet.[15] The VPVOS is charged with executing this mission, and Kulikov notes that it has a strategic significance. In referring to the VPVOS mission, however, Kulikov states that the VPVOS is to provide warning of air and rocket nuclear strikes while repelling the air opponent.[16] Thus, the limitations of the ABM treaty are explicitly recognized and Kulikov also seems to suggest that some protection against missile attack is possible through a combination of warning of missile attack (and, presumably civil defense) and interception of bomber attacks.[17]

(continued)

VPVOS and was largely devoted to generalities concerning the Party's support for the armed forces during the war.

14 Kulikov (1973; 2-3).

15 Kulikov (1973; 4).

16 Kulikov (1973; 4). Note that Garthoff (1984; 313) misinterprets this statement as a reference to the need for PRO, but his interpretation appears to be the result of a mistranslation of *preduprezhdeniye* as "protection" rather than "warning" which is indicated by the context and other VPVOS statements along these lines. Furthermore, Kulikov clearly distinguishes between air and "rocket-nuclear" means of attack. This phrasing is important, as in this section of the editorial Kulikov is arguing that the survivability of the country can be achieved without PRO and suggesting that warning can be used for civil defense purposes.

17 Kulikov (1973; 4). Note that the Soviet Civil Defense Troops were upgraded to a service-level position (their Chief became a Deputy Minister of Defense) in October 1972. See Scott and Scott (1984; 262-63). This suggests an effort to counterbalance the renunciation of active defense with an increased emphasis on passive defense.

Kulikov also suggests a broader role for the VPVOS, giving greater weight to the defense of troops and groups of forces. While noting that the VPVOS is a defensive service, Kulikov states that the VPVOS is necessary to support the other services in their combat operations, particularly supporting their deployment.[18] While not explicitly stating it, Kulikov thereby emphasizes the theater and LOC defense missions.

Kulikov also hints at the role of the VPVOS in defending the homeland against conventional air attacks, pointing out that under all conditions of war, hostilities will rapidly spread to embrace the entire TVD on an enormous scale.[19] Further, all previous wars began with air strikes to surprise the enemy and disrupt his armed forces and seize the initiative.[20] By not specifying a nuclear war, and through his comments on the undetermined character of the war, Kulikov strongly suggests that in either a nuclear or conventional war the VPVOS must be ready to fend off surprise attacks throughout the TVD, even including the homeland.

Having defined the role of the VPVOS, Kulikov goes on to issue fairly standard calls for high combat readiness and effective use of weapons.[21] Kulikov also calls for the VPVOS to increase its low altitude capabilities, suggesting that the threat of low altitude penetration was recognized and the VPVOS was explicitly being tasked to solve the prob-

18 Kulikov (1973; 4).

19 The TVD is a theater of military actions, often translated as a theater of strategic military actions.

20 Kulikov (1973; 4-5).

21 Kulikov (1973; 5-7).

lem.[22] Similarly, there are calls for more work on radioelectronic combat, coordination between VPVOS branches, and troop control.[23] All of these were (and to some extent remain) problem areas for the VPVOS and Kulikov's calls to action, closely reflect existing VPVOS concerns and problems.

Overall, Kulikov's article endorses a conventional and theater role for the VPVOS, while at the same time retaining its more traditional role of defense against strategic nuclear attack. One of its undercurrents is that the VPVOS occupies an important position in the armed forces structure, and can be expected to retain such a position. To some extent the Kulikov editorial is a reassurance that the VPVOS would remain an important component of the Soviet Armed Forces.

Further confirmation and elaboration of the new roles and missions of the VPVOS came later in 1973 in a two-part *Military Thought* series by Batitskiy.

The first article surveys air defense in World War II in a manner very similar, and at times almost identical, to that of Biryuzov, while the discussion of the Great Patriotic War is similar to Batitskiy's previous *Voyenno-istoricheskiy zhurnal* articles.[24] Batitskiy refers to defense of LOCs as the second most important task of the VPVOS, noting that VPVOS forces defended LOCs to a depth of 300-500 km from the front.[25]

22 Kulikov (1973; 7).

23 Kulikov (1973; 7-8).

24 Since *Military Thought* is not available in Russian it is difficult to determine whether some passages are in fact identical. See, for example, Batitskiy (1973; 41-42).

25 Batitskiy (1973a; 47). Note that here Batitskiy seems to be relegating LOC defense to a second place status, if the translation is accurate. Nevertheless, this mission is still accorded high priority.

In the second article Batitskiy raises interesting questions concerning both strategic and tactical air defense. Batitskiy claims that U.S. "doctrine" calls for the use of offensive air capability in a nuclear world war, limited nuclear war, or conventional war. U.S. forces are also claimed to be such that they could be used against the USSR without mobilization. In a conventional war Batitskiy claims the main U.S. attack force would be tactical and naval aircraft, along with tactical missiles. He then goes on to claim that "Missile-armed strategic bombers can in this case be employed to attack deep targets."[26] Aircraft would be used on a mass basis, concentrated to create maximum density in the target area, just as in World War II and Vietnam. Batitskiy then reinvokes his concept of aerospace defense, suggesting that these offensive forces will be used throughout the depth of the battlefield and rear areas.[27] Thus, Batitskiy presents a clear and immediate threat of *conventional* strategic bombing during a conventional war.

To bolster his claims for the importance of air defense, Batitskiy appeals to "foreign military leaders" who purportedly claim that air defense during war may tip the balance in favor of the nation with adequate protection.[28] While Batitskiy demurs and suggests that such views are too extreme, it is clear that he is endorsing them and arguing strongly for the importance of air defenses. This, he points out is demonstrated by the cases of Korea, the Middle East, and Vietnam.[29]

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26 Batitskiy (1973b; 32,43).

27 Batitskiy (1973b; 32).

28 Statements by unnamed "foreign military leaders" are a standard Soviet method of putting forward ideas too extreme or controversial to be stated outright. In this case Batitskiy might have found it difficult to find real foreign leaders who would support this statement.

29 Batitskiy (1973b; 33).

Batitskiy claims that Vietnamese PVO destroyed over 4200 U.S. aircraft over North Vietnam and in the Linebacker II operation destroyed over 80.[30] As discussed later, these figures are inflated by a factor of two to three. Batitskiy further claims that the Vietnamese PVO system was highly effective, although he stops short of claiming that the PVO forced the U.S. to break off the bombing.[31] In an indication of the significance of Vietnam and Egyptian PVO, Batitskiy observes that they allowed the objective determination of the capabilities of the PVO and test the correctness of the organization and conduct of the PVO.[32] The fact that the effectiveness of the Vietnamese PVO system was less than 2% (or 6% by the more optimistic Vietnamese numbers), is not addressed by Batitskiy nor is the relevance of this effectiveness to the operational employment of the VPVOS examined.

After alluding to the effectiveness of the Vietnamese PVO forces, Batitskiy goes on to discuss the impact of nuclear weapons on modern PVO. Batitskiy points out that the problem of small numbers of penetrators is now serious, because of the destructiveness of nuclear weapons, and states that if in the past a 10% attrition rate was sufficient, it is no longer.[33] Having raised the question of effectiveness, Batitskiy indicates the importance of high combat readiness, training, swiftness of action, survivability and stability of the PVO, and organizational structure. The implication is that these are all important components of ef-

30 Batitskiy (1973b; 34).
31 Batitskiy (1973b; 34).
32 Batitskiy (1973b; 34).
33 Batitskiy (1973b; 34-35).

fectiveness, but no indication is given of how to integrate them into an assessment of effectiveness.[34]

The U.S. threat is also portrayed as highly reactive, and Batitskiy notes low altitude penetration and the development of cruise missiles as serious problems for the air defense. Even though new systems such as airborne radar are becoming available, the problem remains a difficult one.[35]

Thus Batitskiy clearly defines a need for extremely high effectiveness in order to thwart a nuclear armed attack, but the very examples he cites seem to demonstrate the impossibility of such an accomplishment. The measures Batitskiy does suggest are nothing more than the same routine exhortations that are recycled annually in the VPVOS literature.

Even though his article was written well after the ABM treaty, Batitskiy reaffirms his earlier claim that air defense troops will become aerospace defense troops. Having noted this, he discusses some trends in ICBM development, most notably the deployment of MIRVs. At the end of the discussion, Batitskiy observes that the ABM Treaty limits ABM forces to the capital, and that future development will only be qualitative.[36] Batitskiy's mention of the ABM treaty is almost offhand, and suggests that he was not enthusiastic about it. Indeed, the ABM treaty almost contradicts Batitskiy's assertion that air defense troops will become aerospace defense troops, and limiting the possibility for the development of the aerospace defense operation.

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34 Batitskiy (1973b; 35-36, 45-6).

35 Batitskiy (1973b; 37-8). For a discussion of Soviet assessments of airborne early warning (AEW) see Lepingwell (1986; 49-64).

36 Batitskiy (1973b; 42-43).

Overall, this article appears to be an argument for continued strong support for the VPVOS even in light of Soviet doctrinal changes and the ABM treaty. The aerospace defense theme is more muted than in earlier works, and there is a great deal more attention to defense against conventionally armed aircraft. The article further suggests a strong interest in defending strategic (homeland) targets against conventionally armed strategic bombers and in LOC defense, especially in a conventional environment.

This new interest in the defense of LOCs is reflected in an article by Svetlishin in *Military Thought*, the last article on the VPVOS in the unclassified collection. Statistics are presented to demonstrate that the majority of actions by the VPVOS were taken against aircraft in frontal areas.[37] Svetlishin thus establishes that strategic bombing was not a large threat, clearly implying that defense of targets in the frontal areas was particularly important for the VPVOS. In terms of manpower, Svetlishin states that no less than half of the VPVOS forces defended LOCs and other field installations, while if VPVOS forces in centers close to the front are counted, the proportion increases to 75-88%.[38] These statistics are different in emphasis from those usually presented, and tend to emphasize the importance of the VPVOS in the defense of the frontal rear.[39]

The articles cited above indicate that by the end of 1973 the VPVOS had begun the transition to a more conventionally-oriented definition of

37 Svetlishin (1973; 89).
38 Svetlishin (1973; 94).
39 Batitskiy (1975a; 45), Zimin (1965; 105), Svetlishin (1965; 24-25).

its roles and missions. In the years following this period particular attention was paid to maneuver of forces from the rear, PVO support for offensive operations, and interaction between VPVOS branches and other services. This is not to say that the mission of defending important administrative-political sites within the country was abandoned. Homeland defense retained its primary importance, as reflected in both deployments, weapons and writings, but it was supplemented by the new mission of LOC and frontal defense.

Where the impetus for change came from, the General Staff or the VPVOS? Two simple alternative are possible: 1) the General Staff imposed the new mission on the VPVOS as a result of its study of the VPVOS in the post-ABM era, or 2) the VPVOS seized on the LOC defense mission as a justification for its continued existence. In appears that the decision to add the LOC mission was a mixture of he two. As has already been pointed out, during this period an overall reevaluation of Soviet strategy and forces was being conducted as the prospect of a conventional phase in a war became more likely. Under such circumstances both the VPVOS Main Staff and the General Staff must have conducted studies on the use of VPVOS forces for conventional missions. While the VPVOS may have preferred to stick to its original mission--homeland defense, in the post-ABM treaty era a new use for its forces must have seemed a military and political necessity. Similarly, the General Staff in evaluating the problems likely to be encountered in a rapid conventional offensive would have required strong LOC defense to counter NATO interdiction efforts. Since the LOC defense mission had a long tradition in the VPVOS, and could be combined with a homeland defense against both conventional and nuclear at-

tacks, this mission may have been the optimal solution for both the General Staff and the VPVOS. In this case there do not appear to have been any conflicting interests.

Thus the mission profile of the VPVOS may have been arrived at through a consensus process. The VPVOS would retain forces for homeland defense against both conventional and nuclear forces, and it would also be assigned a LOC defense mission in the European theater. The continuation of the VPVOS and its forces in the post-ABM period is therefore not completely due to bureaucratic inertia: the roles and missions of the service shifted so that it maintained some relevance to the overall strategy formulated by the General Staff.

6.3 Operational Art in the Post-ABM Treaty Era

Several factors contributed to the need to reassess VPVOS operational art: the lessons of "local wars" (Vietnam, the 1967 Arab-Israeli war, the Canal War and the 1973 Arab-Israeli war), the shift to a more conventionally oriented strategy, and new developments in the U.S. threat. In this section all of these factors and their impact on VPVOS operational art will be examined. The VPVOS's reaction appears to be well represented by the organizational politics model, which provides significant insights into VPVOS learning behavior and the process of development of operational art.

6.3.1 Learning from Local Wars: Vietnam

While the first lessons of Vietnam began to be learned in the mid-1960s during the U.S. bombing of North Vietnam, VPVOS response to these

developments appears to have been rather slow, and detailed discussions of Vietnam only begin to appear in *Vestnik PVO* in the 1970s. Hence, there is reason to believe that most of the lessons of Vietnam were only assimilated and acted upon during the 1970s. Of the lessons of Vietnam the most important pertains to the SAMs. This was their first use in combat, and the results appear to have come as a surprise to the VPVOS.

How well did Soviet SAMs perform in Vietnam? Here we run into the problem of assessing military effectiveness, not an easy task even when dealing with historical events. Nevertheless, it is worthwhile examining this case in order to understand both the "objective facts" and their interpretation by the VPVOS.

The data pertaining to SAM performance in the Vietnam war is presented in Appendix A. While SAMs did present a serious obstacle to U.S. tactical aircraft they did not produce attrition rates significantly greater than those in World War II (1-2%), even if one accepts the greatly inflated North Vietnam figures.[40] Indeed, AAA forces in Vietnam scored more kills than the SAM forces. This result appears to have come as a surprise to the VPVOS, which was expecting significantly higher kill rates from the SAMs.[41]

One exception to the silence on Vietnam during the war years is an article published in early 1967 by Colonel A.S. Orlov.[42] Orlov examines

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40 For a tactical air defense where multiple sorties must be made through the air defense (and hence the effectiveness is compounded) the difference between say 2% and 6% is very significant. But for strategic defenses where only one sortie will be made the difference is quite small.

41 See Chapter 4.

42 Orlov (1967). Colonel Orlov has written on a number of historical issues, particularly the use of the V-1 cruise missile in World War II, and his articles often have direct relevance to contemporary issues.

U.S. means of penetrating and suppressing the North Vietnamese (DRV--Democratic Republic of Vietnam) PVO system, as well as giving western estimates on probability of survival of both tactical and strategic aircraft.

Orlov notes that the high effectiveness of PVO systems has forced the U.S. to use very low altitude penetration. Citing a Western magazine, Orlov claims that U.S. tests have shown that the probability of survival of an aircraft at altitudes of 200-300 m is "not over 0.25-0.5" while flight at altitudes less than 50 m raises the effectiveness of AAA and the danger of hitting the ground, thus keeping the overall probability of survival at less than 0.5. Thus, the optimum penetration altitude is between 50 and 90 m altitude giving a probability of survival of greater than 0.75.[43] Orlov thus provides real estimates of PVO effectiveness clearly indicating that in many altitude regimes the PVO is extremely effective. The implication is that the low altitude attack is the main problem to be solved.

Orlov's article includes a fairly detailed discussion of U.S. penetration tactics in North Vietnam, including defense suppression missions. His conclusion is that the Vietnamese PVO system was causing heavy losses of U.S. aircraft--up to 100 aircraft per month. Furthermore, Orlov claims a 50% effectiveness for air defenses against strategic bombers immediately after giving figures that indicate a 4% effectiveness in Vietnam, with no indication or explanation of why the strategic air defense should be over ten times more effective.[44] Orlov's attrition rate figures also appear to

43 Orlov (1967; 125).

44 Orlov (1967; 125).

be inflated by almost an order of magnitude over those later admitted by the U.S.[45] The discrepancy between PVO performance in Vietnam and the requirements for VPVOS defense against a massive strategic nuclear attack was clear, even if explicit conclusions were not drawn from it. Indeed, Orlov's comment about strategic defenses seems to be a deliberate inflation of effectiveness in reaction to the generally poor showing of the SAMs in Vietnam, to counter possible arguments that Soviet air defenses would not be very effective.

The performance of the Vietnamese PVO was discussed in a contemporaneous article in *Military Thought*. Written not by a PVO officer, but by Col. Nikinorov, a specialist on the Vietnam War, the article indirectly raises some important questions concerning PVO effectiveness. Nikinorov notes that the introduction of SAMs forced a change in U.S. tactics to low altitude attacks in small groups, while at medium and high altitudes the U.S. suffered "significant losses" from SAMs.[46] The Vietnamese PVO system is portrayed as fairly effective.[47] But Nikinorov also cites statistics on the air war, claiming that U.S. figures indicate a loss of 3.2 aircraft per 1000 sorties (.32% attrition rate), although he claims that this statistic includes South Vietnam operations and must be doubled or tripled to get the true effectiveness of the Vietnamese

45 Orlov seems to underestimate the total number of U.S. sorties per month, and overestimates the number of aircraft lost, giving a high attrition rate.

46 Nikinorov (1967; 75).

47 Nikinorov (1967; 76) even quotes a U.S. aircraft carrier commander to the effect that a SAM could destroy a U.S. Skyraider aircraft in 4 seconds if the SAM wasn't detected. Nikinorov fails to point out that the Skyraider was an old turboprop aircraft primarily used in South Vietnam and search and rescue in North Vietnam.

defenses.[48] This "fudge factor" raises the effectiveness to approximately 10 aircraft lost per 1000, but as Nikinorov points out in World War II the U.S. suffered 9 and in Korea 3.5 losses for every thousand sorties.[49] Thus, U.S. losses in North Vietnam were not significantly higher than those in previous wars, a point that Nikinorov clearly indicates by his presentation of the data. Again, however, explicit conclusions concerning the effectiveness of strategic PVO systems are not drawn from this data.

During the first phase of the air war there appears to have been some doubt concerning the effectiveness of SAMs in general and possibly also the overall VPVOS system. These doubts are most clearly revealed in the Nikinorov article. Indeed, Orlov's assertion of 50% effectiveness for strategic air defenses also suggests that the VPVOS recognized that the performance achieved in Vietnam fell far short of what would be necessary for strategic defenses. The neglect of the Vietnam war in the pages of *Vestnik protivovozdushnoy oborony*, particularly the "In Foreign Armies" section, suggests that the VPVOS was not interested in examining the lessons of the war in public.[50] This could be both to avoid admitting the weaknesses of the Vietnamese defenses, and to avoid hinting at possible Soviet countermeasures to the new U.S. tactics.

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48 Nikinorov (1967; 77). In a subsequent passage Nikinorov suggests that losses in North Vietnam were up to 5 times higher than in South Vietnam, which appears to be a reasonable estimate. Even with this increased fudge factor the attrition rate is only 50% higher than in World War II. However this estimate is not borne out by the later U.S. statistics.

49 Nikinorov (1967; 77).

50 The articles that did appear tended to fall into one of three categories: stories of the heroic defenders of North Vietnam (Ivanov (1968)), diatribes against the barbaric air war of the U.S. (Ignat'yev (1971)), and some narrowly focused technical articles on equipment like remotely piloted vehicles (RPVs--see Plyachenko (1971)).

After the Vietnam war there is a sudden increase in interest in the lessons of Vietnam. Analyses of the Vietnam experience pointed out four critical areas: low altitude penetration, the widespread use of electronic countermeasures (ECM), defense suppression, and the appearance of what might be called "virtual attrition."[51] These issues are stressed differently by different authors, but all acknowledge their importance.

The most detailed and interesting of the articles on Vietnam was published in *Vestnik protivovozdushnoy oborony* by Major Ye. Dzhugashvili, under the title "Combat with Low Altitude Targets." This article is intriguing for its direct and critical opening:

> Many foreign specialists in their time considered that with the creation of surface-to-air missiles [SAMs] the problem of combat with means of air attack would be successfully resolved. Certain of them even foretold the "death" of the aircraft as a combat arm because of the inescapability of its destruction by SAMs. However they were convinced of the mistakenness of this opinion when in the summer of 1959 a strategic bomber of the American air force transited all of North America from east to west at an altitude of 150 m without being observed by even one radar station of the air defense [PVO].
>
> The given experiment convincingly showed that prognoses of the "death" of the aircraft were before their time. Apart from that, it revealed serious deficiencies of the air defense [PVO]--the inability to conduct effective combat with low flying targets.[52]

This opening statement raises a number of questions. First, if the experiment was conducted in 1959, why was it "news" in 1972? Second, have the deficiencies in PVO coverage at low altitudes been corrected? Third, who are the "foreign specialists" and might this not be a not very veiled reference to Soviet experts, and even Khrushchev? All of these questions,

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51 Virtual attrition is the reduction in the effectiveness of the attacking force due to the need to assign forces to support and suppression measures because of the air defense.

52 Dzhugashvili (1972; 84).

as well as the extensive discussion of the Vietnam experience, point towards the article having important implications for the modern VPVOS. Thus, the attack on "foreign specialists" is an example of the common Soviet tactic of using foreigners as surrogates in arguments concerning internal Soviet matters. The reference to Khrushchev is also fairly clear, as he was the primary advocate of the dominance of the missile. It is also clearly implied that the advent of SAMs was expected to greatly raise the effectiveness of the PVO. Finally, the problem of low altitude coverage was a real and pressing one for the Soviets at this time. The SA-2 had been found wanting in combat, and while the SA-3 low altitude missile had been deployed its capabilities may have regarded with some skepticism.

Dzhugashvili notes the use of very low altitude attacks by both the U.S. in Vietnam and the Israelis in the 1967 war, and observes that at low altitudes and high speed the effectiveness of SAMs is reduced to between 15-20%.[53] But as we have seen, this estimate is still ten times greater than that achieved in the Vietnam war against aircraft operating at medium altitudes and lower speeds. Despite Dzhugashvili's critical comments about overestimating the effectiveness of SAMs, he seems to be engaging in

53 Dzhugashvili (1972; 84). Note that high speed is described as above Mach 1. Most aircraft, both then and now, are not designed to exceed Mach 1 at low levels for any great length of time. Even if they do so, the consumption of fuel increases greatly limiting their radius of action. Thus, Dzhugashvili is describing a worse-than-expected threat. There is also some uncertainty as to how extensively low altitude penetration was used by U.S. aircraft, for most attacks in North Vietnam were conducted at moderate altitude in order to avoid the AAA fire, even though this increased vulnerability to SAMs. Special defense suppression missions may have made wider use of very low altitude penetration. See Momyer (1978; 136) for a discussion of optimum operating altitudes.

the same game.[54]

While low altitude penetration reduces SAM effectiveness, it also reduces the effectiveness of the attacking aircraft. Dzhugashvili points out that low altitude attacks cause problems of navigation, make maneuvering very difficult, increase vulnerability to AAA fire, and reduce bomb loads to 30-40% of maximum capacity in order for the aircraft to engage in anti-SAM maneuvers. Overall, the capabilities of the attacking aircraft are estimated to be decreased by 40-50% over what they would be flying against an undefended target.[55] On top of this, there is the need to send in support and escort flights to protect against SAM and MiG threats, as well as special defense suppression missions. Dzhugashvili claims that the actual strike group comprised only about 10% of the total flight attacking the target.[56] Thus, there is very significant virtual attrition caused by the PVO system, decreasing the number of attacking aircraft by 90% and reducing their effectiveness by a further 50%, reducing the effectiveness to about 5% of what it would be in the absence of defenses. In tactical use, then, PVO systems appear to exact a very high price from the attacker in terms of lost capability and effectiveness. This price is much higher than that exacted in terms of enemy aircraft lost.

Even though Dzhugashvili stresses the virtual attrition aspect of PVO, his numbers are too optimistic. In particular, the 10% number for the actual strike force is much too low. U.S. authors, and even other

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54 He may be referring to SAMs designed for low altitude interception, rather than a SA-2 type, but even here the results seem optimistic at best.

55 Dzhugashvili (1972; 85).

56 Dzhugashvili (1972; 85). The strike group is the force actually carrying bombs to drop on the target.

Soviet authors note that the strike group comprised approximately 40-50% of each attack force.[57] Even counting all the separate defense suppression missions the total is unlikely to be reduced to 10% of all sorties. Furthermore, the number for the effectiveness of SAMs again appears to be inflated, particularly as it is presented as a degraded effectiveness. While criticizing those who presented the SAM as a wonder weapon, Dzhugashvili still presents overly optimistic assessments of effectiveness, suggesting a willful misinterpretation of the available data.

The description of the problems of combating low altitude targets is followed by a discussion of new foreign SAM systems designed to combat the threat. The advantages of short range, fast reaction time, highly mobile SAMs are noted and radar warning aircraft are presented as the means of gaining good long-range radar coverage at low altitudes.[58] Despite the seriousness of the threat, then, it can be countered by new technologies and systems.

In sum, Dzhugashvili's article presents a mixed message: previous estimates of SAM (and PVO) effectiveness were too optimistic but the development of new technologies will plug the gaps and raise the effectiveness. Even though PVO effectiveness was lower than expected, it still greatly reduced the effectiveness of the attacking aircraft. Here the argument is one that later finds great currency in the VPVOS, that the

57 See the diagram in Momyer (1978; 128) and the discussion on pages 222-226. For a Soviet source citing this number see Shelekhov (1974; 50).

58 Dzhugashvili (1972; 85-86). The use of "mines" placed along possible attack routes fused to detonate when an aircraft flies overhead is also mentioned as one way to destroy very low altitude aircraft. This rather odd approach also appears in several articles in the late-1970s--early 1980s concerning the cruise missile threat, but this appears to be the first reference.

number of aircraft destroyed (attrition) is a less important indicator than the damage prevented to the target. Repelling or reducing the accuracy of an attack can thus be considered a success even if all the aircraft are not destroyed. This theme becomes all the more important as the VPVOS became more concerned with defense against conventionally armed aircraft in the 1970s.

After the Dzhugashvili article a number of articles appeared in *Vestnik protivovozdushnoy oborony* examining U.S. tactics in Vietnam and Israeli tactics in the various Arab-Israeli wars.[59] While these articles stressed various aspects of the war, they tended to follow the conclusions of the Dzhugashvili article and appear intended to inform VPVOS officers about enemy tactics and equipment. One article stands out because of its length, detail, and the prominence of the author.

In 1977 General Lieutenant A. Khyupenen, then Deputy Commander of the SAM Troops (and later the Commander) wrote a lengthy article on the performance of the Vietnamese PVO. While this article presents a detailed review of U.S. tactics, it is the portrayal of PVO effectiveness that is of most interest.

Generally, Khyupenen presents the Vietnamese PVO as highly effective, destroying over 3250 aircraft by the end of 1968, and over 4000 by the end of 1973.[60] These numbers are inflated by a factor of 2 to 3 and were probably supplied by Vietnamese sources.[61] Khyupenen emphasizes the

59 See Deryabin and Boychenko (1973), Shelekhov (1974), Neupokoyev (1974), Khyupenen (1977).

60 Khyupenen (1977; 85).

61 The comparable U.S. figure is 922 aircraft lost to hostile action from 1961-1968. The number lost by the end of 1973 is not readily available. The only major post-1968 operation against North Vietnam was undertaken in December 1972 (Linebacker 2), in which approximately 18 aircraft were destroyed (Momyer (1978; 123). Overall U.S. losses due to hostile action were probably below 1400, although operational losses may increase this

performance of SAMs, claiming that they raised PVO effectiveness significantly and destroyed a total of over 1000 aircraft, an overestimate by a factor of 7.[62] No specific data is presented on MiG kills, but Khyupenen makes the claim that one unit scored over 100 kills against U.S. aircraft.[63]

These figures are supplemented by the claim that PVO effectiveness did not decline even though the U.S. developed more effective ECM and defense suppression techniques. Khyupenen argues that the more effective deployment of forces and the improvement in tactics and knowledge of the enemy allowed the Vietnamese PVO to sustain high attrition rates throughout the combat and that U.S. losses increased over time. It is implied that the November 1968 cessation of bombing was due to the high effectiveness of the PVO. In an even more interesting interpretation of history, Khyupenen argues that the Vietnamese PVO caused the breakoff of the 1972 bombing of Hanoi (Linebacker 2) and forced U.S. acceptance of the Paris peace accords.[64]

Khyupenen's article presents a detailed, interesting, but very biased picture of the air war in Vietnam. The success of the Vietnamese PVO is inflated, while the effectiveness of SAMs is clearly overstated. This article therefore presents a misleading interpretation of the war

(continued)

number to 2000 or more.

62 Khyupenen (1977; 85), for U.S. estimates of SAM kills see Table A.1 in Appendix A.

63 Khyupenen (1977; 85).

64 Khyupenen (1977; 84-85). Many Western sources argue the opposite--that the bombing forced North Vietnam to accept the accords. For this counter-view see Momyer (1978; 236-243).

that is intended to bolster the VPVOS's accomplishments, and particularly those of the SAM Troops. To what extent these figures were actually believed and acted upon by the VPVOS or General Staff leadership is unclear. It is likely, however, that the broad outlines of Khyupenen's article were accepted by the VPVOS: U.S. losses were significant and increased over time, and SAMs did score a fairly high proportion of the kills.

One important lesson emerges clearly from the Vietnam war: PVO systems were not, and could not be, impenetrable. While losses sustained by the U.S. were significant they were not near the level originally expected by the VPVOS. Although SAMs proved quite effective against tactical aircraft making repeated attacks against the same targets their overall performance fell far below that needed to provide an effective defense against strategic bombers in a nuclear war. As noted in the previous chapter, the discovery that SAM effectiveness had been greatly overestimated may have had a serious impact on the credibility of the VPVOS's estimates of PRO performance.

The VPVOS had the opportunity to learn a number of operational and tactical lessons from the Vietnam war. Some of these lessons appear to have been readily understood and acted upon but others were misinterpreted or ignored, resulting in inaction or delayed action. The organizational politics model suggests that those lessons most compatible with the existing organizational views and structure will be those most readily assimilated, while those presenting the most significant discrepancies may be reinterpreted or brushed aside.

What were the lessons of Vietnam? First, SAM effectiveness was much lower than expected, even at medium altitudes. Second, low altitude penetration of the PVO system presented a serious problem.[65] Third, the rapid development and introduction of U.S. ECM and defense suppression measures further reduced the effectiveness of PVO forces (or at least did not allow PVO effectiveness to be greatly increased). Fourth, close in air combat between fighters, called dogfighting, was not obsolete, despite the importance of ground-controlled intercepts and air-to-air guided missiles. Fifth, a determined attacker could successfully penetrate very dense air defenses, and do so repeatedly.

In addition to these rather disappointing lessons, there were some more heartening confirmations of Soviet tactics and operational art. First, the creation of a dense radar net around Hanoi allowed good ground-controlled intercepts and redundant radars for hand-offs to SAM sites.[66] Second, the maneuver, massing, and concentration of forces around certain targets allowed the most effective use of existing forces, confirming a basic tenet of PVO operational art. Third, ambush techniques proved effective, as they had during the Great Patriotic War. Fourth, some experience was gained in coordinating SAM and IA under real combat conditions.

How did the Soviets react to these lessons? To the bad news the reactions were relatively mild. On the first point, as we have seen,

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65 The SA-2 was clearly limited in dealing with these threats and the Vietnamese were not provided with the SA-3 low altitude missile until late in the war. (Isby (1981; 254)). Even had the SA-3 been provided it is unlikely that it would have raised overall effectiveness significantly as it performed poorly in the 1970 canal air combat and in the 1973 war. Furthermore, the dense network of AAA fire was probably about as effective as the SA-3 would have been.

66 Momyer (1978; 118-9).

VPVOS estimates of SAM effectiveness seem to have remained unreasonably optimistic. The low altitude penetration problem was noted, but there do not appear to have been any major changes in weapons or tactics to compensate for this weakness. The SA-3 had already been deployed in the USSR, as had the Tu-126 Moss early warning aircraft, but neither of these systems was adequate to deal with the U.S. threat. In 1975 4-rail launchers for the SA-3 began to be deployed, increasing the number of missiles available and allowing more to be fired at one time. But the SA-3 was a fairly old missile and had performed relatively poorly in combat and this quantitative increase was unlikely to offset its qualitative deficiencies. The SA-6 low altitude missile that performed respectably in the 1973 Arab-Israeli war was never deployed by the VPVOS, despite its good characteristics and high mobility. It is possible that this was in part due to the "not invented here" syndrome--the SA-6 had been designed to PVO SV specifications and not for the VPVOS. But in addition to this the VPVOS had already invested substantially in the SA-3 program and in a period of budget stringency the increase in SA-3 rails would have appeared the cheapest means of increasing SAM firepower.

In the area of IA performance, the VPVOS noted the superior handling and performance characteristics of the Soviet fighters supplied to Vietnam and then proceeded (or continued) to deploy a new generation of fighters that lacked most of these characteristics.[67] Even though VPVOS authors pointed out that air-to-air missiles had not made maneuvering air combat obsolete, there does not appear to have been a shift in tactics or training of IA pilots until after some more direct lessons in the Mid-East.

67 For example, the MiG-23, MiG-25, and Su-15. See Panyelev (1977a,b,c).

The introduction of extensive ECM and defense suppression by the U.S. does appear to have caught the VPVOS's attention. The extent of the reaction to it is difficult to judge, as the ECM-ECCM game can only be evaluated in real combat. However, VPVOS authors did devote a significant amount of space to the use of ECM, as well as defense suppression and decoy maneuvers.[68] This is in keeping with a VPVOS campaign to "know the enemy's tactics" and to prepare their forces to meet the "probable opponent."[69] The result of this campaign is unclear, and any technical improvements to increase jam-resistance have not been revealed. Tactical training stresses tracking and destruction of targets under jamming conditions, but the realism and extent of this training cannot be adequately judged from the literature. The relatively low level of training simulators available and the incentive structure for training (simpler is better) all suggest that Soviet forces may not be well prepared to counter a sophisticated ECM threat. Overall, there is no evidence of a massive program of ECCM training.

The VPVOS appears not to have come to grips with the problem of defeating or repelling or defeating a determined enemy. Discussions of "impenetrable" defenses appear less often but the fiction of always destroying the target with the first missile is maintained. The rare estimates of effectiveness still suggest confidence in disrupting a conventional attack, but their effectiveness against a nuclear attack could not have been considered satisfactory.

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68 Discussions of ECM may be found in, amongst others, Orlov (1967), Plyachenko (1969), Shelekhov (1974), Paliy (1975), Ignat'yev (1976), Klimovich (1980), and Chernukhin (1981).

69 Batitskiy (1972c), Gromov (1976), Mil'chenko (1971).

On the positive side, the Soviets received confirmation of some of the main tenets of operational art and tactics. Maneuver, concentration, and use of mobile forces to ambush enemy aircraft were all contributors to the effective use of PVO forces.[70] However, some of the good news went relatively unnoticed. While VPVOS commentators noted that at low altitudes aircraft were forced into the range of AAA fire, there was little elaboration on this problem, nor was the question of AAA deployment and effectiveness examined in a separate article. This neglect of AAA forces may have been largely due to the fact that by the late 1960s--early 1970s the VPVOS had no AAA forces, the responsibility for such arms lying with the PVO SV. Despite this, the Vietnam war, the 1970 canal war, and the 1973 Arab-Israeli war all demonstrated that a combined AAA/SAM defense provided the highest effectiveness and created a coordinated fire network that provided mutual support for the AAA and SAMs.[71] Whether such an integration of AAA and SAM systems at the strategic PVO level was considered is unclear. Certainly, given the low effectiveness of the SAMs an AAA adjunct might possibly have a noticeable effect, particularly for point defense of very small targets where high density can be achieved. They could not, of course, be expected to greatly increase effectiveness against a strategic bombing offensive.

The success of thick radar coverage and ground control of interceptors was noted by the U.S. as well as the Soviets.[72] The redundancy of the radars combined with their relatively high power may have limited the

70 Nordeen (1985; 13, 22).

71 See, for example, the description in Herzog (1984; 307-308).

72 Indeed, one Soviet source cites Broughton (1969) on the effectiveness of Vietnamese ground-controlled intercepts, see Khyupenen (1977; 81).

effectiveness of U.S. ECM capabilities. In this case the Soviet tendency to hang on to old equipment, and to overdesign new equipment (in terms of output power) may have proven advantageous. In short, in the deployment of multiple radars and extensive AAA forces the Vietnamese and their Soviet backers were following a conservative, incrementalist policy that seems to have worked better than a less incremental policy might have (e.g. SAM-based defenses with fewer but more sophisticated radars).

Overall, the Vietnam episode suggests that organizational considerations and structure did contribute to an overestimation of PVO effectiveness, and that while the VPVOS did learn some significant lessons from Vietnam several others were neglected. Most of the lessons of Vietnam were obvious by the end of 1968, when the U.S. bombing of Vietnam was halted, but they were not acted upon until the experience of later local wars (particularly the 1973 war) amplified and confirmed the lessons. Thus, a lag of several (3-5) years took place in VPVOS learning, and some of the lessons of these local wars were not taken to heart until the early 1980s, if even then.

6.3.2 The Arab-Israeli Wars

The VPVOS gave a great deal of attention to the Arab-Israeli wars but as with the Vietnam war, their interpretations are biased by their preconceptions and preoccupations. The 1970 "Canal War" and the 1973 Arab-Israeli war were of particular importance to the VPVOS, because the combat was much closer to that of a general European war, and the VPVOS was closely and directly connected to the conflict.[73]

73 The 1967 war is not viewed by the VPVOS as a test of air defense systems or technologies. Rather, it is used as an example of what happens if the PVO's combat readiness is low and the enemy achieves tactical and operational surprise. See, for example, Shesterin (1977; 77).

After the Israelis commenced extensive air raids along the Suez in July 1969, and deep raids in January 1970, the Egyptians turned to the USSR for assistance in developing an effective PVO system.[74] Marshal Batitskiy is reported to have visited Egypt in December 1969 to investigate the (generally poor) performance of PVO systems, and again in July 1970 after Soviet pilots were shot down in a dogfight with Israeli aircraft.[75] As a further indicator of the seriousness with which the Soviets viewed the Egyptian PVO system, V.V. Okunev, previously the Commander of the Moscow PVO District, was dispatched to Egypt to oversee the work.[76] This high-level attention to the problem suggests that the VPVOS may have regarded this not only as an important state mission, but also as an opportunity to prove the effectiveness of PVO systems and the competence of their personnel. At the very least it would provide good data on the performance of their systems in combat.

By April 1970 Soviet pilots had started flying operational missions over Egypt, and by the end of June a thick PVO system had been established some distance back from the Suez Canal.[77] While the 1970 conflict demonstrated that Soviet PVO systems could be fairly effective, they were not effective enough to cause the Israelis to break off their attacks.

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74 Herzog (1984; 210-214), Schiff (1985; 157-159).

75 Herzog (1984; 214, 218) The Commander in Chief of the Soviet Air Forces (VVS) also visited on the later occasion. It is not clear from which service these pilots were drawn. Given that the MiG-21 was not in general VPVOS service at the time the pilots were probably from the Soviet Air Force acting under the overall control of the Soviet air defense representative on the scene--most likely Okunev. .

76 Erickson (1971; 99).

77 Herzog (1984; 216-7).

Furthermore, Soviet pilots were proven inferior in their flying skill and combat ability in contrast to the experienced Israeli pilots.[78]

During the 1973 war the Egyptians deployed a very dense PVO system that was able to cover the airspace over the Suez Canal and some distance into the Sinai using SA-2, SA-3, SA-6 SAMs and the ZSU-23-4 mobile anti-aircraft gun.[79] This networked, overlapping system proved highly effective against Israeli aircraft, particularly in the first hours of the war when tactical and technological surprise favored the Egyptians.[80]

The VPVOS appears to have considered the Mid East experience a vindication for Soviet arms and operational art, and it drew a number of specific conclusions.[81] First, PVO could be highly effective in a tactical environment against tactical fighter bombers, preventing the enemy from attaining air superiority. Second, SAMs continued to be the main means of PVO. Third, low altitude penetration presented the greatest threat to PVO systems. Fourth, air combat most definitely was not dead and pilots must be able to engage in maneuvering air combat. Fifth, interaction of SAM, AAA and IA forces is crucial to the effective use of forces. Sixth, ECM and defense suppression measures could be fairly effective in reducing the attacker's losses. Many of these lessons reinforced those from the Vietnam war. Let us briefly examine the VPVOS's views on each of these issues in turn.

On the first issue, the 1973 war was acclaimed even in the West and

78 Schiff (1985; 158-9).
79 Herzog (1984; 217-218).
80 Herzog (1984; 309-311).
81 Shelekhov (1974; 49-50), Shesterin (1977; 79-80).

by the Israelis, as proof of the effectiveness of tactical SAM systems.[82] While to some extent this has been exaggerated, the SAM systems did prove quite effective in a tactical context, even though effectivenesses were similar to those in Vietnam.

The VPVOS literature reflected this optimistic appraisal, often citing Western sources in order to bolster the veracity of the arguments.[83] Modern U.S.-built aircraft such as the A-4 Skyhawk and the F-4 Phantom had suffered significant losses from Soviet SAMs, and more importantly, the Israeli Air Force was unable to attain air superiority and was seriously hampered in accomplishing its close air support mission.[84] This high effectiveness was due primarily to the thick SAM and AAA belt near the canal, for as VPVOS authors point out, over 80% of Israeli losses were due to SAM fire.[85] VPVOS sources give total numbers of aircraft destroyed but there is no discussion of effectiveness rates, nor is sufficient data given to enable their derivation. According to Western sources, although the SAMs were highly effective in the first few hours of the war, their overall effectiveness dropped over time and averaged the same as Vietnam.[86] Nevertheless, the Israelis avoided them wherever possible.

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82 Herzog (1984; 311), for example, notes that "many of the accepted concepts about air war would have to be changed."

83 Shesterin's 1977 article is a good example of this approach.

84 Shesterin (1977; 77), Shelekhov (1977; 49-50).

85 Shesterin (1977; 77). Most of the other losses were due to AAA fire. This argument for the primacy of the SAM only holds for the Arabs. On the Israeli side the proportions were reversed, with almost all Arab losses coming from air combat. This fact is *never* mentioned by Soviet commentators, and often neglected by Western commentators.

86 Isby (1981; 247, 254, 260). This was due to the rapid supply to Israel of modern ECM equipment modified to counter the SA-6 SAM. Here the effect of technological surprise was crucial for the Egyptians--Israeli aircraft had no warning or ECM systems to counter the SA-6 and in the first few hours of the war many Israelis were caught by surprise by this new weapon. The ability of the Egyptians to achieve such surprise against a very well-equipped and prepared enemy should perhaps serve as a lesson to the West in the limits of intelligence capabilities.

Low altitude penetration was recognized as the main threat to the PVO, and measures to counter it, such as the establishment of a network of visual observers (similar to the old VNOS visual warning system) were noted.[87] This measure, first seen in the 1973 war, has been adopted by the VPVOS to supplement its low altitude radar coverage.[88] Another measure used in 1973 (after initial use in Vietnam) was the overlapping of SAM systems to provide mutual support, and their augmentation by AAA systems such as the ZSU-23. This joint use of AAA and SAM systems allowed all-altitude coverage, and a substantial number of the aircraft damaged or destroyed were hit by AAA fire while trying to fly under the SAMs or attacking the SAM sites.[89] The use of the ZSU-23s and SA-6s along with SA-2s and SA-3s suggests that the Egyptian air defense system was a mix of VPVOS and PVO SV forces and planning, although under the overall supervision of Okunev.[90]

The most striking result of VPVOS reaction to the experience of local wars, was an interest in maneuvering air combat. The lessons of Vietnam had been brought home forcibly in 1970 when Soviet pilots were decimated by Israeli fighters in their only engagement.[91] This incident

87 Shesterin (1977; 81).

88 Falichev (1987; 2), Mal'tsev (1987; 2).

89 Herzog (1984; 217-218), Shesterin (1977; 79).

90 Erickson (1971; 99) also notes the presence of a large number of Ground Forces personnel.

91 This engagement has been characterized as an Israeli ambush, which seems quite likely. After the incident, Soviet pilots avoided any actions that could lead to an engagement with the Israelis, so there is only one data point from which to extrapolate. This avoidance may itself indicate the confidence with which the Soviets regarded their air combat capabilities.

suggested to the Soviets that they could no longer dismiss the enormously high Egyptian air combat losses as a result of poor flying aptitude on the part of the Egyptians. Furthermore, during the 1973 war, Arab pilots trained by the Soviets lost approximately 334 aircraft in air combat, as against 5 for the Israelis.[92] These results forced a recognition that Soviet pilot training, and particularly VPVOS training, was not meeting the demands of real combat.

The new stress on air combat training starts in 1971 and continues to the end of the period under consideration. In 1971 Batitskiy refers directly to the need for IA to prepare for maneuver combat, an unusually detailed observation for a service chief.[93] This call was echoed in later Batitskiy editorials, and in several other articles specially dedicated to the problem, particularly after the 1973 war.[94] One of the Deputy Commanders of the VPVOS, and the former chief of Fighter Aviation, Marshal Savitskiy, noted that large air battles were possible and that pilots must avoid routine and "classical" solutions to problems. But while calling for greater flexibility, Savitskiy noted that the place for the commander

92 Herzog (1984; 310). Schiff (1985; 161) gives figures of 227 and 6, respectively. Either way the imbalance in favor of the Israelis, flying roughly equal aircraft, is enormous. One Egyptian source implies that 90 Israeli aircraft were destroyed in air combat, but this seems implausibly high. It is also noted that approximately half of Israeli sorties were for air cover, thus reducing the effectiveness of their ground support activities substantially. See Badri, Magdoub, Zohdy (1978; 157, 159). While this book has much invaluable data on the air war and air defense, some of the figures appear biased. Thus, it is claimed that total Israeli losses were 280 aircraft, citing Soviet reports. Most VPVOS articles do not give figures on total losses, but Shesterin (1977; 77) accepts the lower Israeli figure of 115 aircraft lost.

93 Batitskiy (1971; 10).

94 See Batitskiy (1972; 10), Yezhov (1973; 106), Savitskiy (1973; 9-11), Shelekhov (1974; 79), Yelkin (1976; 16-21), Panchenko (1976), Poltavtsev (1977).

of the IA regiment is in the command post, not in the aircraft.[95] Savitskiy's article was written just before the 1973 war, and reflects a tendency to minimize the need for change. The exhortations to increase flexibility are watered down by the emphasis on ground control by the commander. Here, the initiative and flexibility is not at the level of the pilot, but rather that of the commander in his regimental command post watching the radar screens. Subsequent discussions of the role of the regimental commander confirm that this basic tension between initiative and centralized control remained throughout this period.

But despite the increased concern with training in dogfighting the 1982 Lebanon air war pointed out continuing deficiencies in this area, suggesting that the VPVOS still has not fully absorbed this lesson and taken the necessary measures.[96] In contrast, the U.S. used the lessons of Vietnam to develop new training programs and tactical aircraft that made a major difference to USAF combat effectiveness in the mid-1970s and 1980s.[97]

The effectiveness of the SAMs combined with the new emphasis on IA in group combat led to the problem of interaction between the two branches. Even though Arab aviation was largely defeated in air combat it also suffered significant (over 10% of total) losses due to friendly fire.[98] This result apparently highlighted the problem of SAM and IA in-

95 Savitskiy (1973; 9-11, 13).

96 See the discussion in Chapter 8.

97 Specifically the F-16, F-18 and F-15 aircraft as well as the "aggressor squadrons" and "top gun" schools for realistic dogfighting training.

98 Herzog (1984; 311). In contrast, the Israelis claim that none of their aircraft were hit by friendly fire, see Weinraub (1987; 54).

teraction, and articles by high ranking officers noting the problem (usually by analogy to the Great Patriotic War) appeared.[99]

Finally, the Arab-Israeli wars confirmed the lesson of Vietnam that ECM played a key role in the offense-defense interaction. Most of the articles discussed above examined the effects of ECM on defense penetration, portraying it as a serious problem, but one that could be overcome by good training and persistence on the part of weapons operators. U.S. technical efforts in this area were followed quite closely in the VPVOS press, but there was little in the way of operational assessment of the equipment.[100]

In sum, the VPVOS took the experience of the Mid East to heart, and evinced serious concern over the low altitude threat, the need to improve air combat capability, and to work out smooth interaction between branches. All of these measures were also necessary to improve VPVOS capabilities for the new roles and missions assigned in the theater. The officer directly responsible for Egyptian air defense assistance, Okunev, was promoted to First Deputy Chief of the VPVOS in 1974, placing him in the perfect position to apply the experience gained in the Middle East.[101] But despite the apparent realization of these problem areas, measures to correct them do not appear to have been very successful: new fighters had poorer air combat performance, while the solution to the low altitude threat was increased deployment of the ineffective SA-3.

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99 Grishkov (1974), Zimin (1975), Neupokoyev (1977),Sedov (1977; 50).

100 Paliy (1975), Shelekhov (1973), Shelekhov (1974; 52), Ignat'yev (1976).

101 Okunev was presumably thrown out of Egypt along with other Soviet advisers in 1972, but he is identified as First Deputy Chief of the VPVOS only from June 1974. See CIA (1974; 7). Okunev's predecessor, Army General Shcheglov was moved over to the Warsaw Pact staff, presumably with responsibility for PVO. This shift in itself might auger a greater VPVOS role in Warsaw Pact PVO.

While there is less evidence of distortion or misperception of the lessons of the 1973 war than for the Vietnam war, there are still issues that stand out. Perhaps most noteworthy is the relative balance between IA and SAM effectiveness. While Soviet SAMs performed adequately in the war, and were hailed as highly successful by the VPVOS press, IA forces performed poorly by any estimation. Although the campaign to improve air combat performance was initiated, it seems to have been rather half-hearted and had to be renewed again after the 1982 debacle in Lebanon. Traditional ground controlled intercept tactics and the narrow interpretation of initiative weighed against rapid VPVOS reform in this area. More surprising is that in the mid-to-late 1970s there was a shift in emphasis towards IA, with new aircraft increasing while SAM forces remained relatively stable.[102] While this may represent an attempt to correct the problems encountered in the 1973 war, many of the new aircraft introduced had worse air combat capabilities than the MiG-21s used in that war. As noted in the discussion of Vietnam, the air combat lessons were not completely accepted, or if they were the time lag was very long. Furthermore, while the problem of interaction between IA and SAMs was recognized, there appears to have been little new thought or training on this problem.[103]

Finally, while the forces trained and equipped by the Soviets had scored an impressive tactical victory, this accomplishment was tempered by the fact that overall effectiveness still remained around 2% and even the

102 See Figures 5.1-5.3.

103 For some of the few works on this topic see Grishkov (1974), Zimin (1975) and Goncharov (1982).

peak effectiveness of approximately 10% was only accomplished due to tactical and technological surprise rather than an increase in intrinsic effectiveness. The implications for strategic air defense against bombers carrying nuclear weapons are therefore less encouraging, for the penetration rate would be well over 90%, resulting in enormous destruction. Thus, from a strategic perspective the experience of the local wars probably confirmed the wisdom of a new emphasis on the more manageable problem of defense against conventional attack, with defense against nuclear forces still remaining important, albeit less feasible.

6.3.3 PVO in the European Theater

Initial indications of VPVOS reconsideration of its roles and missions appear in 1971, before the treaty was formalized but well after the prospects for deployment of a PRO system had become very dim.[104] Articles addressing PVO issues more directly related to combat with tactical aircraft and theater defense began to appear more regularly.

The earliest clear example of greater interest in theater PVO is an article in *Vestnik PVO* in October 1971 that characterizes the threat and the VPVOS response. In this article Colonel Polyakov defines the threat to include tactical aircraft as well as strategic aviation and cruise missiles, emphasizing the different characteristics of tactical and strategic aviation while examining aspects of large group tactics.[105] This article lays out many of the issues that preoccupy the VPVOS in the 1970s: the problem of low altitude penetration, the need to maneuver forces rapidly,

104 See the previous chapter.
105 Polyakov (1971; 17-18).

the defense suppression threat posed by remotely piloted vehicles (RPVs) and electronic countermeasures (ECM), and the need for careful preparation by the commander and knowledge of enemy tactics.[106] A later article by Major General Mil'chenko addresses the issue of preparation of the commander and knowledge of the enemy's tactics and again stresses that both strategic and tactical aviation constitute important threats, particularly tactical aviation with its short flight time.[107]

Other indications of a new stress on conventional and theater operations are found in discussions of the need for more attention to group maneuvering air combat by IA units, and the need to increase low altitude interception capabilities, both skills needed more in a tactical than strategic environment. These points were reflected in Zimin's 1971 article where he noted the growing importance of the shift to low altitude penetration, the development of modern maneuverable fighters such as the F-14 and F-15, and the development of AWACS aircraft.[108] These Western developments received a great deal of attention in the Soviet press in the following years.[109] While this concern was partly due to the relatively poor showing in air-to-air combat by Soviet trained pilots in local wars there would have been little incentive for the VPVOS to make this a major issue if the main threat were strategic aviation. Against large, heavy, non-maneuverable targets the dogfighting tactics of the Mid East and Vietnam would be of comparatively little use, although the shortcomings in

106 Polyakov (1971; 16-19).

107 Milchenko (1971).

108 Zimin (1971; 79).

109 See Lepingwell (1986) for a review of Soviet assessments of Western air defense technology and systems.

pilot skill revealed in those conflicts implied problems in fulfilling even relatively simple intercepts. Furthermore, the explicit characterization of tactical aviation as a primary threat was new. While previous articles had characterized and evaluated NATO tactical air assets, in 1971 they are being clearly presented in articles dealing with VPVOS tactics and operations

As a further indication of the growing importance of conventional operations the year 1971 also saw the creation of a new section in *Vestnik PVO*, a back page devoted to a technical review of enemy armaments, particularly fighter-bombers.[110]

In the realm of military-historical literature, a short absence of major articles on the VPVOS in 1969-1970 was broken by a noteworthy article by Svetlishin on the Kursk operation. The Soviets regard the Kursk operation as the turning point of the Great Patriotic War, marking the final transition from the strategic defensive to the strategic offensive. Svetlishin's article also appears to mark a turning point in the VPVOS military-historical literature. After this article, there is greater attention to the VPVOS role in strategic offensive operations.

Svetlishin starts off in a highly unusual manner by directly criticizing other authors for neglecting 1943 in monographs on VPVOS history.[111] During the battle of Kursk, the VPVOS was primarily responsible for the defense of railroads feeding the Soviet buildup, and during the

110 See, for example p. 87 of *Vestnik PVO* numbers 4 and 7, 1971.

111 Svetlishin criticizes Batitskiy (1968), Ashkerov (1960), and Desnitskiy (1961) amongst others. This is despite the fact that Batitskiy's book presents a fairly comprehensive account of the entire war, and that Svetlishin was a member of its author's collective.

Soviet counteroffensive maneuver was used to establish PVO on liberated territory. Combined maneuver of PVO SV and VPVOS units was widely used, especially for river crossings and to create reserve forces.[112]

The battle of Kursk was a critical one for the VPVOS because for the first time it had to concentrate on the defense of LOCs rather than urban-industrial centers. Kursk taught the VPVOS three new means of PVO employment: 1) to repel massive German attacks with massive VPVOS forces, up to an IA division at a time, 2) to concentrate forces by wide maneuver of IA forces, allowing the transition from point to zonal defense, 3) the creation of maneuver and mobile groups for screening important railroad targets.[113] Further, Kursk also presented the problem of keeping up with rapidly moving offensive forces, requiring rapid maneuver and employment of reserves. Thus, Kursk may be seen as the first example of the use of the VPVOS in offensive operations. The criticism of the other authors suggests that Svetlishin considered the operation particularly significant and important, and also flagged the fact that this was an area to be examined in more detail. The problem of LOC defense and PVO of offensive operations was to receive greater attention in the years to come as the VPVOS adjusted to new roles and missions.

Since much of the discussion of operational art in the unclassified literature takes place in studies of history, it is not surprising to find a renewed interest in the VPVOS in the Great Patriotic War, and articles specifically calling for more study of this period.

112 Svetlishin (1971; 28).
113 Svetlishin (1971; 31).

The importance of historical study for solving contemporary problems was stressed in a two-part article that appeared in early 1972 in *Vestnik protivovozdushnoy oborony* by Major General of Artillery I. Dzhordzhadze and Col. F. Shesterin.[114] These articles stress the elements of surprise, organizational structure, maneuver, combat readiness, and includes a fairly detailed discussion of LOC defense.

The authors take an approach reminiscent of Biryuzov, stressing the importance of surprise at the beginning of war, citing the World War II examples of Poland, Norway, France, Pearl Harbor, and the Soviet Union. These surprise attacks were aimed at both front and rear forces, with the goal of destroying enemy air power and gaining air mastery. Even the Soviet PVO system was not fully deployed at the beginning of the Great Patriotic War, and full deployment took several days, resulting in very difficult conditions for carrying out the PVO mission.[115] Three reasons for the success of surprise are presented: 1) a lack of appreciation of the significance of the air battle and an overconcentration on ground and naval combat, 2) insufficient equipping and combat readiness of air defense troops, 3) weak preparation of command cadres in questions of combat with enemy aviation. It is implied that these reasons applied to the USSR as well as to the Western states.[116] These criticisms of an underemphasis on air combat and poor preparation for it are highly unusual,

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114 Dzhordzhadze and Shesterin (1972a, 1972b). Shesterin is a professor (*Dotsent*), presumably at a military academy, see Shesterin (1977). He has authored several articles in *Voyenno-istoricheskiy zhurnal* and *Military Thought* on air force and air defense issues. Dzhordzhadze's position is not known, although judging from his rank, the paper topic, and his collaborator he is probably the department head of a military academy.

115 Dzhordzhadze and Shesterin (1972a; 23).

116 Dzhordzhadze and Shesterin (1972a; 21-22).

and may be aimed at current Soviet practice as much as past practice.[117] Indeed, these statements imply that there is a danger of PVO forces being neglected in overall resource allocation, a topic that is rarely touched on in this literature. In part, then, this set of arguments appears to be stressing the importance of maintaining a strong VPVOS. Furthermore, the stress on surprise attacks against air assets may be part of an argument in favor of extensive PVO screening of forward deployed Soviet Air Force assets. This emphasis on the danger of surprise is a reiteration of earlier VPVOS concerns, but it has been enlarged to incorporate both attacks on tactical forces and rear areas. Of particular concern is the attempt of the enemy to attain air superiority an issue of great importance in the theater.

The authors pay a good deal of attention to the LOC defense mission, presenting it as particularly important during the third period of the war (after Kursk) and highly successful in preventing railway delays.[118] To accomplish LOC and frontal area PVO the authors emphasize the importance of maneuver, pointing out that it allows PVO gaps near the front to be

117 The Soviet Union began in the 1970s a large buildup in tactical aviation forces, perhaps reflecting a recognition that aviation had in fact been neglected in previous years.

118 The authors claim that in 1943 there were 1039 railroad delays, while in 1944 there were only a few short breaks in the work of the railroads. This data is particularly interesting, for most accounts of Kursk and of railroad PVO claim only a few short breaks, or even none. The 1039 delays do not appear to have been cited elsewhere in the PVO literature, and imply that the Luftwaffe interdiction effort may have had a noticeable, and even significant, effect on Soviet LOCs. See Dzhordzhadze and Shesterin (1972a; 25-26). Almost paradoxically, they state that the number of German flights declined from 1943 to 1944, from 7000 to 1161 flights. A large number of these flights were probably directed against the railroad yards near Kursk. The reason for the decline in Luftwaffe flights is not given but appears to be a result of aircraft losses combined with increased VPVOS resistance.

filled by forces brought up from the rear and augmentation existing PVO SV. Maneuver also allowed the use of zonal defenses at Kursk as well as in the general defense of railroads during 1943-44.[119] Zonal defense is thus presented as the main form of defense of LOCs.

Overall, the first article by Dzhordzhadze and Shesterin emphasizes the importance of preventing surprise by raising combat readiness, greater recognition of the importance of airpower and attention to the problem of defense of LOCs. For the latter zonal defense by IA is presented as the primary means of executing the mission.

Dzhordzhadze and Shesterin's second article examines the post-war development of the VPVOS. Their discussion of organizational developments is very similar to that presented in Batitskiy's book on the history of the PVO.[120] The authors stress the importance of the development of the anti-air operation in the post-war years, clearly indicating its importance for the present.[121] Particularly important is their argument that VPVOS combat activities are highly dependent upon the strategic conditions at the fronts. Thus, they note that there is a substantial difference between the defensive portion of the Great Patriotic War and the later strategic offensive period.[122] This dependence is of great importance. If the VPVOS were charged only with strategic defense against nuclear attack, then there would be little dependence between its missions and the situation at the fronts. What Dzhordzhadze and Shesterin imply is that the missions of the VPVOS are directly dependent on the situation at the

119 Dzhordzhadze and Shesterin (1972a; 27).
120 See Chapter 4 and Batitskiy (1968; 334-72).
121 Dzhordzhadze and Shesterin (1972; 28-29).
122 Dzhordzhadze and Shesterin (1972; 28-29).

front, and therefore that the VPVOS has missions that pertain to warfare at the front level.

It therefore appears that Dzhordzhadze and Shesterin are arguing for greater attention to the third period of the war and for new work in the military-historical literature. While doing so, however, they are confirming the importance of the anti-air operation, particularly the use of maneuver and employment of reserves. This set of articles thus seems to set the stage for broader consideration of VPVOS history, particularly the connection between the VPVOS and the ground forces and other services. In the following years this call for a renewal of military history was taken up, producing a great deal of literature on this subject, including problems of air defense in a conventional war.[123]

In the 1970s the VPVOS military-historical literature in *Voyenno-istoricheskiy zhurnal* shows a definite swing away from city defense towards problems of LOC defense during offensive operations. This change appears to reflect the use of the historical literature to examine problems of relevance to the present, in keeping with Dzhordzhadze and Shesterin's call for greater work in this field. Several main trends may be discerned in this work.

First, there is a greater concern with the tactics and operational issues involved in LOC defense, particularly railroads, yards, and stations.[124] In order to provide for the defense of railroads a number of

123 In 1973, an article by Col. Yakimanskiy and Major Gorbunov discussing the postwar development of the VPVOS appeared in *Voyenno-istoricheskiy zhurnal*, reiterating many of Dzhordzhadze and Shesterin's points about the VPVOS and its operational art. See Yakimanskiy and Gorbunov (1973).

124 See Anaymovich (1972; 59-60) on railroad tactics and branch interaction, Svetlishin (1974a) on LOC defense at Stalingrad, Bednenko and Mikhaylenko (1974) on the Byelorussian operation, Komarov (1974) on the Petsamo-Kirkenssoy operation, Batitskiy (1975; 45-46) on the third period of the war, Batitskiy (1977b).

special tactics were used, such as placing AAA on trains, establishing fighter patrols over railroad lines, using small mobile groups of AAA to "ambush" German aircraft, and the use of armored AAA trains to enhance mobility and protect different stations.

Second, the use of VPVOS forces to protect LOCs and the rear of the fronts presents the problem of coordinating the interaction between VPVOS forces and those of the PVO SV and the Soviet Air Force. This problem received a good deal of attention, as did the problem of interaction between VPVOS branches. For the most part however, these discussions emphasized simple issues like the creation of joint documents outlining the rules of interaction, and coordination of zones. Several authors also noted the importance of the formation of operational groups combining VPVOS and PVO SV officers to defend one objective with their joint forces.[125]

Third, of particular concern was the use of combined maneuver to prevent the creation of gaps between the VPVOS and PVO SV. This issue is tied up with both logistical problems (complaints of insufficient transport are common) and organization structure (an issue discussed later). Suffice it to say here that gaps between the advancing PVO SV and the VPVOS did arise, sometimes becoming quite wide.[126]

Fourth, the experience of the later periods of the war clearly indicated to the VPVOS the importance of creating an organization structure that could meet both the demands of the front and ensure centralized con-

125 Anaymovich (1972), Svetlishin (1974; 29), Bednenko and Mikhaylenko (1974; 15), Komarov (1974; 30-33), Svetlishin (1977; 104).
126 Bednenko and Mikhaylenko (1974; 15), Svetlishin (1977; 110-114).

trol of forces. This important issue, both in the Great Patriotic War and the present, is examined in a later section.

In sum, the military-historical literature of this period reflects an increased interest in LOC defense. The absence of articles on the defense of Moscow and Leningrad, the classic examples of defense of cities, contrasts with that of the revolution in military affairs period, strengthening the conclusion that a shift towards VPVOS use in conventional operations took place. The new mission of LOC defense appears to have required a reconsideration of the experience of the Great Patriotic War, resulting in a significant surge in total articles, and articles addressing the issue of LOC defense and the later periods of the war in particular. There is increased concern over the interaction of branches, maneuver of forces to occupied territory, and formation of operational groups for local defense coordination and interaction with ground forces. These questions are solved by application of the basic principles of operational art, especially the concentration on zonal defense, maneuver, and the echeloning of forces. Thus, different areas of operational art are stressed in accord with the new missions.

What is the relevance of historical experience to the present? Dzhordzhadze and Shesterin argue strongly that there is direct relevance, as do other authors in this period. Given, however, that the Soviets do not expect to fight another conventional war on their own territory, what do these articles tell us about possible modern VPVOS employment? One possibility is that many of the principles elaborated regarding the VPVOS are to be applied to Warsaw Pact PVO forces: in the course of an offensive operation into Western Europe air defense gaps behind the advancing forces

would be filled by Warsaw Pact PVO forces, excluding VPVOS forces.[127] In such a case the VPVOS would retain its homeland defense mission. It is even conceivable that some VPVOS forces would be moved into the Eastern districts of the Warsaw Pact countries to augment their air defense as the Pact forces are redeployed to the west. This would seem to be consistent with Batitskiy's concern about possible conventional strategic bombing and would ensure that VPVOS forces remain intact when the transition to nuclear war occurs. In this case the historical literature is actually discussing the operational art and missions of the East German, Polish, and Czech PVO forces.

Another possibility is that the VPVOS would undertake some missions in Eastern (and even Western) Europe, deploying forces forward from the USSR to plug gaps between the advancing PVO SV and the deployed Warsaw Pact PVO forces. This would appear to be a much more demanding mission, for it would involve large scale movement of forces and coordination with forward PVO SV and rear Warsaw Pact PVO forces. Nevertheless, the emphasis on maneuver of VPVOS forces in the military historical literature, combined with comments concerning the maneuverability of fighter aviation forces, strongly suggests that in the event of a conventional war in Europe there may have been plans to deploy VPVOS IA forces into Eastern Europe to perform crucial LOC defense missions. Here, though, we find a contradiction with the primary mission of the VPVOS, homeland defense. The forward movement of VPVOS forces would lessen the defense of the homeland, placing more of the burden on the SAM forces that are less

127 One problem with this plan is that Warsaw Pact PVO forces are not very well equipped.

maneuverable. There are no clear signs of the VPVOS coming to grips with this problem of contradictory missions. During the Great Patriotic War the problem did not arise, as the range of aircraft was limited and there was no threat of nuclear escalation. Thus, in the case of a war in Europe the question of major VPVOS redeployment would no doubt be a major issue for the military and political leadership, the outcome depending to a large extent on estimates of the likelihood of nuclear escalation against the homeland. Such a decision would be made by the General Staff in consultation with the Defense Committee or Defense Council, not by the VPVOS alone. As the historical literature points out, deployment of VPVOS forces during the Great Patriotic War was determined by the Stavka not by the VPVOS leadership.[128]

Even in the case of nuclear escalation by NATO two scenarios are possible, and these scenarios pose the same problem for the VPVOS. First, if NATO initiates use of nuclear weapons at the tactical level employing tactical airpower, forward deployment of VPVOS forces might be considered essential to the effective air defense of LOCs and even the Western Military Districts of the USSR. Thus, by deploying VPVOS forces forward the VPVOS may achieve its aim of increasing the number and depth of defensive echelons.

The second scenario might be considered a follow-on to the first. In the event that there is rapid nuclear escalation by either side (the Warsaw Pact in response to initial NATO use, or NATO escalation after unsuccessful tactical use) VPVOS forces might be caught out of position in

128 This issue is discussed in more detail in the next chapter.

Eastern Europe and unable to engage U.S. strategic bombers attacking the USSR.

Thus, there are strong contradictory incentives, both to forward deploy VPVOS forces, and to retain them for homeland defense. This problem must have weighed heavily on VPVOS and General Staff planners.

There does not appear to be enough data in the articles surveyed to allow us to determine whether, or how, a clear choice was made between the two possible uses of the VPVOS. It is possible, and even likely, that such a decision was not made until the late 1970s. Nevertheless, during this period the VPVOS clearly took on the responsibility for preparing for this mission.

6.4 VPVOS Threat Perceptions and Misperceptions

As the role of the VPVOS changed, so did its threat perceptions and analyses. These changes are most clearly reflected in the "In Foreign Armies" section of *Vestnik PVO*. During this period the VPVOS showed a strong interest in the strategic aviation threat and in tactical aviation, while discussions of Western PRO and ASAT programs disappeared almost entirely, and the emphasis on strategic missiles diminished. In this section some aspects of this literature will be examined in more detail to determine how Western actions and equipment were perceived by the VPVOS.

The threat perceptions and lessons arising from the use of aviation in local wars has been described above. In this section I investigate VPVOS perceptions of the strategic environment and threat in relation to their primary mission of homeland defense. Throughout this period the VPVOS paid fairly close attention to the development of U.S. strategic

forces, particularly the air-breathing component. While the ICBM and SLBM forces were not ignored, the bulk of the material focused on the bomber, cruise missile, and air-to-surface missile threat.[129] These articles were primarily devoted to the prospective threat, with a time horizon of several years to almost 10 years. Indeed, the VPVOS showed interest in the B-1 bomber and the air-launched cruise missile (ALCM) at a very early stage in their development.

In 1972 the first discussion of the B-1 and ALCM appeared in *Vestnik PVO*, in an article that explicitly noted that strategic aviation will continue to comprise a significant part of U.S. strategic offensive forces.[130] The technical characteristics given for these weapons appear to be fairly accurate, given the early stage of development and testing. It was claimed that the B-1 was required because the B-52 had a low probability of penetrating a strong PVO system.[131] Overall, the strategic threat is portrayed as well equipped and growing more dangerous, with future deployment of both new bombers and air-to-surface missiles posing new problems for the VPVOS. There is no indication of likely PVO effectiveness, PVO countermeasures, or U.S. plans for using these weapons, nor do such discussions appear in other VPVOS threat descriptions. These issues are apparently considered too sensitive for general discussion, although

129 See, for example Shelekhov (1972), Shelekhov (1978), Shelekhov (1979), Ignat'yev (1979), Borisov (1977).

130 Mil'chenko (1971; 63) mentions the B-1 and the SCAD but doesn't give any details. (The ALCM was at this time known as the SCAD--Supersonic Cruise Armed Decoy, an outgrowth of a program for an advanced unarmed decoy. See Werrell (1985; 144-150).) Shelekhov (1972; 82) gives the first detailed examination of these arms. This article also contains a fairly detailed discussion of the Short-Range Attack Missile (SRAM) that was just being deployed in SAC at the time.

131 Shelekhov (1972; 84).

some *Vestnik PVO* articles on *Western* air defenses occasionally touch on them.[132]

From 1972 the VPVOS tracked the development of the ALCM quite closely and during the mid-70s it appears to have become a topic of some concern to the VPVOS leadership. While cruise missiles were not new to the VPVOS, some having been deployed in Europe in the late 1950s and early 1960s, these new generation weapons posed a qualitatively greater threat.[133] The realization that the new cruise missiles presented a new threat was somewhat slow, and it was not until later in the decade that the VPVOS fully appreciated the full ramifications of cruise missile development.

One of the first indications of growing VPVOS interest in cruise missiles is found in the historical literature. An article published in *Vestnik PVO* examined British air defense performance against the V-1, noting both the ineffectiveness of pre-emptive bomber strikes against V-1 launchers and the relatively high effectiveness of the air defenses.[134] The importance of the proper organization and echeloning of defenses is emphasized, and the author reports an effectiveness of 60% towards the end of the campaign.[135] However, only the capture of the V-1 launchers com-

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132 See Lepingwell (1986).

133 Werrell (1985; 108-112, 156-64, 178-87). Most VPVOS comments on cruise missiles in the 1960s and early 1970s were limited to a ritual statement on the ability of IA to destroy both aircraft and cruise missiles. See, for example, Korablev (1967; 12-13), Khalipov (1968; 11). Biryuzov discusses British defenses against the V-1 in his 1961 article (1961; 25-6) but does not comment on Soviet preparations to repel a V-1 attack.

134 Orlov (1971; 90-91).

135 Orlov (1971; 90-91). Many of these points are also made in a later article by Orlov in *Voyenno-istoricheskiy zhurnal* (1975). An earlier Orlov (1970) article on the use of cruise missiles concentrates less on their PVO aspects than on the questions of targeting and strategy. Orlov appears to be the "resident expert" on the V weapons.

pletely halted the V-1 threat.[136] This article is quite accurate in its portrayal of the interaction between the offense and defense, but it also implicitly raises a number of questions concerning modern PVO and cruise missiles.[137] First, how should the echelons be constructed? Second, are SAMs or IA to be the primary means of combat with cruise missiles? Third, what effectiveness can be expected, are cruise missiles more vulnerable to PVO forces? While no answers to these questions are given in this article, or explicitly in the VPVOS literature, there are hints that they were being considered during this period.

On the question of effectiveness, the allusions to high PVO effectiveness in World War II suggest that the VPVOS considered cruise missiles particularly vulnerable. There are also some more modern indications of this view. Thus, in his 1971 article, Polyakov notes the possible use of cruise missiles and remotely piloted vehicles (RPVs) and suggests that while they may be used for defense suppression and penetration, that they tend to be more vulnerable than piloted aircraft because of their lower maneuverability and responsiveness. While a joint attack of bombers and cruise missiles might complicate the defense of a target, it is not presented as an insuperable problem, merely requiring more skillful use of PVO forces for its defeat.[138] The cruise missile in itself is not seen as a major new threat, rather it is its joint use with bombers that presents a problem.

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136 Orlov (1971; 91).
137 Compare it to Briggs (1981).
138 Polyakov (1971; 18).

While the cruise missile garnered some attention in 1971, the significance of the new threat does not appear to have been fully appreciated until the mid 1970s. In 1973 Batitskiy published his *Military Thought* articles on VPVOS history, largely reiterating Biryuzov's comments on the ineffectiveness of cruise missiles.[139] Two years later, however, a reappraisal of the importance of cruise missiles appears to have taken place. In both the historical and editorial literature cruise missiles take on a higher priority.

Apparently for the first time, in 1975 Batitskiy discusses *Soviet* preparations in the Fall of 1944 to defend against V-1 attacks on Leningrad and Moscow.[140] Of course, such an attack never took place, but Batitskiy claims that VPVOS forces were organized in a deeply echeloned structure and uses this threat to justify retaining large forces around the major administrative and industrial centers.[141] This theme is picked up by Svetlishin a year later in an article on organizational structure and troop control, that in August 1944 the commanders of the Leningrad PVO army, the Moscow Special PVO Army, and the North PVO Front collaborated on a plan for V-1 defense.[142] While Svetlishin doesn't elaborate on the point, the very fact that it is mentioned suggests that Batitskiy's article sparked new interest in, and discussion of, the problem of defense against the V-1.[143]

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139 Batitskiy (1973a; 44).

140 Batitskiy (1975; 45). Defense against cruise missiles is alluded to in Batitskiy (1968; 333) but nothing substantive is said.

141 Batitskiy (1975; 45).

142 Svetlishin (1976; 42).

143 Svetlishin had not mentioned plans for defense against cruise missiles before this time despite several opportunities to do so.

Batitskiy raised the increasing threat of the cruise missile in a 1976 editorial in *Vestnik PVO*, placing the cruise missile at the top of the list of threatening new U.S. arms developments.[144] Two months later an article on tactical and operational preparation of commanders noted that at the end of World War II defense against both ballistic and cruise missiles had been placed on the agenda. The threat of a new generation of air-to-surface missiles with low radar cross section, low altitude and high speed flight capability, and long range allowing launch outside of PVO range is emphasized as one of the factors requiring even greater knowledge and skill on the part of VPVOS commanders.[145] No solutions to this threat, other than greater efforts to develop the tactics and operational art of the VPVOS are given, but the article serves as a further indicator that the development of cruise missiles was viewed with some concern by the VPVOS.

In 1977, more detailed discussions of the cruise missile threat are presented, and Batitskiy alludes to the weapons in an editorial, but it is not until 1978 that cruise missiles are the subject of their own article.[146] Cruise missiles are presented as highly accurate, capable systems to be used primarily for defense suppression or as stand-off weapons. The

144 Batitskiy (1976; 7).

145 Buturlin and Golodnyy (1976; 17, 18). Note that the authors do not specify that these are cruise missiles, but rather mention air-to-surface missiles in general. Thus, they may also be referring to the SRAM and the projected follow-on the Advanced Strategic Air Launched Missile (ASALM) as well.

146 See Batitskiy (1977; 5), Borisov (1977). Note, however, that Batitskiy does not refer to the V-1 in his 1977 historical article in *Voyenno-istoricheskiy zhurnal*. Other Batitskiy editorials of this period do not address specifics of the U.S. threat and do not mention any particular weapons, including the cruise missile. The article on cruise missiles is Shelekhov (1978).

author notes that while a B-52 could carry up to 20 of these weapons, a modified Boeing 747 could carry 70 to 90. A projection of up to 2300 air-launched cruise missiles for the U.S. Air Force (including 500 for training) is given, plus 1200 sea-launched cruise missiles for the Navy, with France and West Germany working on similar weapons.[147] The prognosis, then, was for a total of 3000 nuclear armed cruise missiles. These numbers suggest why the VPVOS showed growing interest in the cruise missile: they posed a large, complex threat to the PVO system as a whole. Notwithstanding their technical advantages, the sheer number of penetrators could stress the system very severely.

As the cruise missile programs reached deployment decisions VPVOS coverage of them increased, and by the 1980s a great deal of attention was paid to the new threat as the weapons were actually deployed. These later reactions are discussed in the next chapter.[148]

VPVOS reaction to cruise missiles appears to have passed through two stages. In the first stage, up to the mid 1970s, cruise missiles appear to have been regarded in light of the successful British defenses and the postwar failure of the U.S. to develop an effective cruise missile. Cruise missiles were regarded primarily as aids to penetration, to overload, confuse, and suppress PVO systems. Their relative lack of maneuverability made them more vulnerable to interception, although their large numbers and small size might to some extent counteract this ad-

147 Shelekhov (1978; 87).

148 See Sozinov (1978; 3), Ignat'yev (1980), Chistyakov (1979). For a review of VPVOS reaction to cruise missile deployment in the 1980s see the next chapter.

vantage. The example of World War II held out the hope of the PVO scoring high attrition rates against such targets.

In the second stage the scale of the U.S. program and its high technical level made a strong impression on Soviet threat analysis. The cruise missile was recognized as a highly accurate weapon, and its low altitude and speed would make interception very difficult. While there still may have been hopes for high attrition rates, the very large numbers discussed in the Western press would have required a very large force to intercept and destroy all the cruise missiles. Because ALCM launch might occur before landfall the VPVOS's preferred tactic of intercepting the cruise missile carrier before launch was made extremely difficult, if not impossible. In the worst case scenario, instead of 300 penetrating bombers, the VPVOS might be faced with 3000 penetrating cruise missiles. Such a threat demanded serious consideration.

What does this case tell us in terms of learning and organizational behavior? First, we should note that the initial response was to interpret the new threat in light of past experience, a common trait of organizational behavior. The new cruise missiles were not clearly differentiated from previous generations of cruise missiles resulting in an underestimation of the threat.

Second, when the emerging threat was gradually recognized, it was referred to first in the historical literature, and the lessons of the past were examined for relevance to the present. The creation of a deeply echeloned defense was presented as the Great Patriotic War solution, and this pointed the way to a contemporary solution.

Third, the threat was used in calls for greater stress on traditional operational art principles and for better training and preparation for commanders. Nowhere is it hinted that the new weapons might not be vulnerable to existing PVO systems.

Fourth, Western estimates of technical parameters were taken at face value. Rarely was there any criticism of ALCM technology or its performance. Despite the harsh and vocal criticism of the cruise missile by some Western analysts, the VPVOS did not emphasize or discuss in detail the program's testing problems and deficiencies. Instead the analyses could be termed "worst case" in that they accepted the optimistic estimates of the U.S. military and industry.

Fifth, while Western estimates of cruise missile performance were published, there was no quantitative or even explicit qualitative discussion of the cruise missile's ability to penetrate PVO systems except in the historical material. While the articles present the problem of interception as difficult, nowhere is there a clear indication of exactly how difficult it might be. In part this might reflect a lack of good Western sources to cite, but it is also characteristic of the VPVOS to avoid giving any effectiveness figures, particularly in the post-Vietnam era. By reading between the lines, and examining the cruise missile performance figures, however, the magnitude of the threat must have been clear to most VPVOS officers.

In sum, the cruise missile case suggests that the VPVOS did react in a manner suggested by the organizational politics model. The VPVOS tended not to recognize the threat, and when the danger became clear it relied on tried and true methods of assessment, analysis and

countermeasure. The VPVOS did not appear to engage in threat inflation in order to argue for increased funding, primarily because the threat did not need inflation. The new cruise missiles posed such a major threat to the effectiveness of the existing PVO system that any further inflation might have made the problem seem insuperable. Instead the VPVOS presented the threat fairly clearly, and in the editorials by Batitskiy called attention to the threat. Rather than inflating the threat, the VPVOS gave it a prominent place in its literature and did appear to suggest that measures had to be taken to counter the cruise missile.

6.5 Summary

During this period the VPVOS shifted towards greater involvement in defense against conventional attack, in response to both changing Soviet strategy and the conditions of the post-ABM treaty world.

The first point to note is that the VPVOS did not wither away after the ABM treaty. While VPVOS funding declined somewhat it retained fairly high force levels and an increase in funding appears to have been starting towards the late 70s.[149] The VPVOS retained its primary mission of homeland defense and augmented it with an increased role in LOC defense in the theater.

How did the transition to conventional and theater missions come about? I argue that the VPVOS and the General Staff reached a decision partly based upon military analysis (the need for strong PVO of LOCs in a conventional campaign, the remaining nuclear bomber threat) and partly based upon organizational considerations (the desire to preserve the

149 CIA (1978; 5-6).

VPVOS, sunk costs, inertia, conservatism). Given the immense sunk costs in the VPVOS, finding a new and efficient use for the force made sense for all concerned. There was a convergence of interests between the General Staff and the VPVOS that allowed the redefinition of VPVOS missions and ensured its continued role in the changing Soviet force structure.

There are indications that VPVOS leaders engaged in advocacy for the continued strong support of the service, particularly Batitskiy's citation of foreign experts on the growing importance of air defense, and his stress on the conventional strategic bombing threat.[150] The articles of Zimin and Grishkov also suggest that the VPVOS was arguing for the importance of air defense. Kulikov's editorial appears to have signalled the General Staff's decision on the role of the VPVOS in both conventional and strategic operations. The fact that this editorial came after early evidence of VPVOS interest in conventional operations suggests that Kulikov's editorial was the official confirmation of a new role worked out between the VPVOS and the General Staff. Certainly, while the new role and missions of the VPVOS posed new problems for the VPVOS they also ensured the service a set part in the overall Soviet force structure even under the changing doctrine of the time.

The interaction between the General Staff and the VPVOS in this case appears to have been largely non-conflictual, and bureaucratic politics does not appear to have played a major role. While there was some advocacy for continued VPVOS support the existing VPVOS forces provided a needed capability for conventional operations and this need for increased PVO coverage appears to have been the decisive factor in the decision to

150 Batitskiy (1973b; 33).

maintain a strong VPVOS force. Thus the continued support for the VPVOS does not reflect a simple bureaucratic inertia, but rather the joint interests of the General Staff and the VPVOS in carrying out a mission consistent with Soviet strategy.

While the decision concerning the future of the VPVOS appears to have been worked out by a process involving the VPVOS and the General Staff most of the details of operational art and tactics were determined within the VPVOS and appear to be well represented by the organizational politics model.

In the area of learning behavior the VPVOS displayed a tendency to selective interpretation of experience and misperception of the adversary's intentions. This was clearly the case with the interpretation of, and reaction to, the lessons of Vietnam and the Middle East, but it also appears to hold for some strategic issues as well. Certainly the concern over conventional strategic bombing represented a quite striking misunderstanding of U.S. strategy. Similarly, the nature and extent of the cruise missile threat was only slowly realized because of existing preconceptions and biases. On balance, though, the VPVOS did a fair job of interpreting U.S. strategic force developments, although the estimates of technology and effectiveness appear to have been worst case estimates. Rarely were doubts expressed about the technological capabilities of U.S. weapons or the likelihood of their deployment.

In the VPVOS's shift to a more conventionally-oriented role, we again see a combination of rational military analysis combined with organizational influences such as sunk costs, inertia and advocacy. Yet there appears to have been little conflict between the actors in this decision-

making process and bureaucratic politics was not a major factor. In the next chapter, however, we examine a debate over VPVOS organization structure that did involve significant differences in organizational perspectives.

CHAPTER 7

ORGANIZATIONAL STRUCTURE

7.1 Introduction

In 1980-81 the VPVOS underwent a major reorganization that resulted in a complete restructuring of its forces. This reorganization was not a whim on the part of the General Staff or the Politburo, instead it was the end result of a long study of the optimal organization of the VPVOS and PVO SV within the overall structure of the Soviet Armed Forces. In this chapter the factors contributing to this reorganization, and VPVOS and PVO SV viewpoints on the necessity and appropriate form of organization are considered in detail.

The debate over the VPVOS reorganization differs significantly from that over PRO because viewpoints and issues appear to have remained fairly constant over time. Therefore, rather than presenting a chronological summary of the debate, the positions of the relevant parties are examined for their points of agreement and contention. This allows a comparison of the organizational viewpoints expressed before the reorganization with the details of the reorganization. From this comparison it becomes quite clear that the reorganization was not a VPVOS initiative because it contradicted many of the basic principles of VPVOS operational art and theory. Instead, the reorganization appears to have been a decision by the General Staff that overrode VPVOS objections and was intended to pro-

duce a more efficient allocation of forces to conventional warfare missions.

7.2 Reappraising Organizational Structure

Several factors contributed to the debate over PVO interaction and organizational structure. First, there was a General Staff reexamination of the Soviet strategic command and control system. This reexamination may have started as early as 1968 and the pivotal article on this topic was published in 1975 by Marshal Kulikov, the Chief of the General Staff.[1] One of Kulikov's primary concerns was the control of multi-front operations, and for this purpose he endorsed an intermediate level of command and control at the TVD level between the General Staff and the fronts.[2] This idea was supported by his successor, Marshal Ogarkov, who pressed for the creation of these TVD level commands during peacetime.[3] Given this ferment, the question of the organization of the VPVOS within this new structure must naturally have arisen.[4]

Second, as noted in the previous chapter, the VPVOS itself faced new challenges inherent in its conventional missions and may itself have instituted a study of command and control options. Interaction between VPVOS and PVO SV forces would be a topic of particular concern.

Third, as the VPVOS literature of the late 1960s and early 1970s continually stresses, the widespread introduction of electronics, com-

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1 Rice (1987; 68-69). The article in question was published in *Voyenno-istoricheskiy zhurnal*, Kulikov (1975).

2 Rice (1987; 69), Kulikov (1975; 15-16).

3 Rice (1987; 69).

4 Indeed, Kulikov refers to the Stavka's role in ensuring interaction between the services during the Great Patriotic War mentioning coordination between fronts and PVO forces as one of his examples. Kulikov (1975; 22).

puters, and automated systems of control (ASUs) into the VPVOS control system was providing new opportunities for improving command and control.[5] This may have spurred interest in new means of strategic and operational level troop control.[6]

Fourth, towards the late 1970s the ramifications of the cruise missile threat were finally becoming clear to both the VPVOS and the General Staff. The realization of the danger presented by cruise missiles may have caused a reappraisal of VPVOS forces and organization.[7]

All these reasons to reconsider the role of the VPVOS, seem to have come together in the late 1970s. A hypothetical chronology, based on some known data points, is given in Table 7.1. In it I assume that the final decision for any reorganization would have had to take place at least a year, and possibly 18 months, before its implementation in order to allow time for planning and execution.

One event that may have influenced the debate over reorganization is the 1978 KAL incident that not only showed up some weaknesses in the VPVOS structure and capabilities, but also precipitated a change in VPVOS leadership.[8] But despite this change, VPVOS views on organizational structure remained fairly stable over the period under consideration.

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5 The importance of automation runs throughout the VPVOS troop control literature. For an overview of some debates associated with the introduction of ASUs see Bremner (1984). Some of the articles by Batitskiy that touch on the issue of ASUs are Batitskiy (1969; 8), (1972c; 9-10), (1973b; 41), (1974; 4-5), (1978; 7).

6 The classic Soviet work on the impact of computers (cybernetics) on command and control is the book by Kontorov and Druzhinin (1978). Druzhinin was commander of the RTV troops in the 1960s before joining the General Staff.

7 Jones (1982; 138-40).

8 The 1978 KAL incident is examined in detail in Appendix B.

Table 7.1: Illustrative Chronology of the VPVOS reorganization

1975 Kulikov article. Initial discussions of PVO reorganization.

1976 Studies of reorganization, Svetlishin article on Fronts

1977 Decision to form TVDs probably made. Ogarkov becomes Chief of GS in January (Akhromeyev (1986; 506)).

1978 April--KAL 1978. Koldunov appointed CinC VPVOS in July. December--Formation of Far East TVD. Strusevich article

1979 Further discussion of reorganization? Probable decision on reorganization.

1980 Last possible moment for decision. Mid-year, beginning of reorganization of VPVOS?

1981 Reorganization.

1982 VPVO Chief of Staff Romanov killed, Mal'tsev into Main Staff.

1983 KAL 007.

1984 Ogarkov out in Fall. Discussion of reversal?

1985 Decision to reverse? (By at least beginning of year.)

1986 De-reorganization. Mal'tsev article.

Thus, by 1978-1979 the debate over VPVOS reorganization should have been nearing its culmination, and this surmise is supported by some of the evidence cited below.

7.3 Changes in Organizational Structure

The reorganization of the VPVO was conducted relatively quietly and it took several years for Western analysts to fully understand its dimensions and implications. The reorganization appears to have had two major aspects: 1) peacetime control of VPVO forces was assigned to a deputy

commander of the Military District and 2) the PVO SV was formally incorporated within the VPVO. During wartime the control of VPVO forces would be vested in a deputy commander for air defense at the TVD level.

In addition to these organizational changes almost half of the VPVO's fighter aviation assets were transferred to the Air Forces of the Military Districts, leaving the VPVO with a force of approximately 1,200 interceptors. Simultaneously, two of the three VPVOS aviation schools were transferred to the Air Force, and the schools and academy of the PVO SV were transferred to the VPVO. Force size seems to have increased to 630,000, but this number is very approximate. Finally, the Baku Air Defense District was dissolved, leaving the Moscow Air Defense District as the only "named" PVO district.[9] These changes had major implications for the overall command and control of VPVO forces, as well as their effectiveness in performing a variety of missions.

The first indications of a merger of the VPVOS and PVO SV appeared in late 1980, and the name change and full reorganization appears to have taken place in January, 1981.[10] This change was also reflected in *Vestnik PVO*, and in the March issue articles on PVO SV issues began to appear in the journal.[11]

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9 U.S. Department of Defense (1984; 36-39, 55), Scott and Scott (1984;160-164), Urban (1983; 204), Jones (1981; 83-85). The above sources suggest that the transfer of IA assets took place in 1981, however Collins (1985; 186) places the transfer in 1982-83. Collins's numbers could be due to the late realization of the reorganization by IISS and other force-counting organizations. On the size increase see Breightner (1983; 125).

10 Jones (1981; 83).

11 It appears that the editorial staff were not informed of the change until the last moment, for while the January *Vestnik PVO* issue bills itself as the journal of the VPVO and the editorial refers to the VPVO, but the rest of the material in the journal refers to the VPVO ***strany*** (VPVOS) as before. The delay of several months for the PVO SV material is consistent with the publishing lag for Soviet military journals.

The place and role of the old PVO SV in the VPVO is rather uncertain, but it appears to have been accorded a status rather like (or higher than) a branch, and the former Commander of PVO SV, Levchenko, became a First Deputy Commander in Chief of the VPVO.[12] Levchenko's successor, Chesnokov, also received this post.[13] The VPVO literature does not refer to the PVO SV or its forces as a separate branch and there is little indication of how these forces were integrated into the branch structure. The traditional SAM troops, Fighter Aviation, and Radiotechnical branches were retained but it is not clear if PVO SV forces were integrated into them or remained separate.[14] It is most likely that the PVO SV became a branch within the VPVO but that its forces were directly subordinated to the military districts (or Groups of Forces in Eastern Europe) and some SAM units might even have been assigned to them.[15]

The delineation of responsibility between the TVDs and the VPVO central leadership is also uncertain. In place of the 16 air defense districts, an military district-based system was established, with operational control going to the TVD commands in wartime. But the five TVD commands (Western (Central Europe), Northwestern, Southern, South Western, Far Eastern) that would form the new "PVO Districts" do not include a Central TVD for defense of the homeland.[16] Thus it is likely that in ad-

12 See his obituary in *Krasnaya zvezda* August 29, 1982, p. 3.

13 Chesnokov (1982).

14 In such a case it is assumed that AAA forces would be subsumed under the SAM branch.

15 Some evidence for the PVO SV retaining some independence, or at least a separate identity, may be found in the continuation of the PVO section in the SV journal *Voyennyy vestnik*. Indeed, *Vestnik PVO* appears to have changed fairly little, with only a few articles per issue specifically devoted to PVO SV issues.

16 International Institute for Strategic Studies (IISS) (1987; 35), also Urban (1983; 204), Department of Defense (1987; 16). Note that IISS suggests that the VPVO took over some of the Air Force's interceptors rather than vice versa.

dition to the TVD level commands there is a centralized command (like the old Central PVO Front in the Great Patriotic War) with control of homeland defense forces, probably based on the Moscow Air Defense District.[17] This would be in accord with the reported transfer of large IA forces to the Air Forces of the Military Districts in the border districts, with the central IA forces (defending the industrialized area West of the Urals) under the direct command of the VPVO or a Central PVO Front.[18] If this surmise is correct, the VPVO would have retained a comparatively small centralized force for homeland defense, while command and control of perhaps half the previous force (plus all of the PVO SV forces) would be controlled by the TVD commands.

Some of the factors considered in making this decision may be briefly outlined here before we examine the arguments of the VPVOS and PVO SV in detail.

Of particular importance was the need to increase the effectiveness of PVO coordination with the Soviet Air Force and PVO SV forces. Centralization at the TVD level would reduce the number of overlapping control systems and various subordinations, concentrating authority in the PVO Deputy. At the same time, the Deputy would be more closely responsible to the TVD commander, thus ensuring that VPVO forces were used

17 Suvorov (1984; 78) notes that the "named" Air Defense Districts like Moscow and (formerly) Baku would become PVO Fronts during wartime. This, of course, refers to the time before the reorganization.

18 "Organization of the Soviet Armed Forces" (1987; 60) note that the reorganization merged IA in border districts with the Air Force, whereas Department of Defense (1987; 60) merely states that IA was merged with the Air Force.

in the interests of the conventional offensive, rather than being withheld to meet a potential strategic threat.

Several other factors may have entered into the decision calculus. Local wars had demonstrated the synergy between AAA and SAMs, particularly during offensives. The VPVOS, however, had no AAA, so if rear installations were to be defended by a combination of VPVOS SAM and ground force AAA forces problems of coordination and interaction would invariably arise. One possible solution to this problem would have been the subordination of both of these forces to one service and commander.

Perhaps more important was the emergence of the cruise missile threat, particularly the intermediate nuclear forces (INF) threat. As noted in Chapter 6, the VPVOS reaction to the cruise missile had two stages and in the second stage the nature and magnitude of the threat sank in. But in 1979 the ground-launched cruise missile threat was added, posing the problem of providing a reliable defense against cruise missiles launched from the European theater against both TVD and homeland targets. Although the threat of 364 ground-launched cruise missiles might not seem very substantial in comparison with other strategic threats it should be kept in mind that cruise missiles were also being considered for a range of conventional attack missions, with the prospect of deploying far more than a few hundred. The TVD reorganization, by centralizing PVO forces within the TVD may have had the advantage of being able to concentrate TVD PVO forces against this threat. Furthermore, PVO SV forces had the low-altitude equipment necessary for combating cruise missiles in the TVD, and coordinating this force with the VPVO forces would be necessary in order

to increase the overall effectiveness.[19]

While it is unlikely that concern over the ground-launched cruise missile threat was the main driving force behind the VPVOS reorganization, it may have been an important contributing factor.[20] During the early 1980s the cruise missile threat (both air and ground launched) received a good deal of attention. It was a featured threat in editorials, figured prominently in assessments of the U.S. threat, and was even explicitly discussed in training material.[21] There is a sense throughout these articles that modern low altitude SAM systems and IA forces can successfully intercept cruise missiles, perhaps augmented with more unusual methods such as "mining" approaches with charges that detonate as the cruise missile passes overhead.[22] But there was also a sense of technological optimism in the VPVO in a direction favorable to the cruise missiles: the VPVO believed most of the optimistic Western estimates of effectiveness

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19 A similar argument is made in Jones (1982; 138-140), although he attributes the concern more to air-launched than to ground-launched cruise missiles. Furthermore, he suggests that the VPVOS leadership endorsed such an approach, for which there is little evidence, and a good amount to the contrary.

20 See, for example Sayenko's January 1981 article in *Vestnik PVO* stressing that the best weapons against cruise missiles were mobile AAA (ZSUs), low-altitude SAMs, and even portable SAMs.

21 For example the January 1981 editorial singled out cruise missiles as a new and important threat, see "K novym sversheniyam," (1981; 5). Koldunov refers to the INF cruise missile threat in Koldunov (1981; 8), (1982; 8), (1984; 4). On cruise missiles in threat assessments see Shelekhov (1979), Ignat'yev (1979), Ignat'yev (1980), Shelekhov (1981), Savitskiy (1982), Nikolayev and Chernukhin (1984), Leonov (1985), Polynin (1985). On IA training and cruise missiles see Moskvitelev (1984), (1985). A historical examination of the problem is presented in Franishin (1984), although it gives fewer figures than Orlov's earlier articles.

22 This unusual concept recurs often in Soviet discussions of cruise missile defense, even though it does not appear to be common in the Western literature. See Dzhugashvili (1972; 86), Leonov (1985; 84), Sayenko (1981; 77).

and reliability. Thus the threat was depicted as both serious and manageable, and a good argument for a greater commitment of resources to the VPVO.[23]

The cruise missile threat did not unambiguously point towards a TVD level organization, as the large threat against the homeland could also be used as an argument for centralized control against a massed, highly structured bomber and cruise missile attack. Such an argument would stress the need for overall national coordination of defensive forces throughout the depth of the country and TVD to ensure interaction between echelons and maneuverability of forces. It is this argument that begins to appear in some VPVO literature after the reorganization, albeit couched in historical terms. The next section presents an overview of the VPVO literature during the period preceding the reorganization and the discussions of organizational structure to be found there.

7.4 Organizational Viewpoints and Reorganization

The ideas and principles embodied in the VPVOS reorganization can be compared to the views and opinions expressed by representatives of the PVO SV and VPVOS during the years preceding (and following) the reorganization. In doing so one finds quite striking divergence on several major issues such as VPVOS--PVO SV interaction, levels of centralization, and command and control. In the sections below the views of the two forces are examined and contrasted. The VPVOS position is considered first, as

23 A more cynical view, not to be found in the VPVO (or broader Soviet) press is that cruise missiles make the problem of air defense so difficult that it is not worth attempting and that only a more limited warning and assessment system is required (or possible). This argument is examined in more detail in the conclusions.

it sets out the basic issues and positions, against which we may contrast the PVO SV viewpoints.

7.5 VPVOS Viewpoints

Discussions of VPVOS organizational structure appear to have started just after the ABM Treaty and picked up momentum after Kulikov's 1975 article on strategic leadership. VPVO views of the reorganization are primarily revealed in discussions of historical events, particularly the performance of the VPVOS in the last period of the Great Patriotic War. The details of the wartime reorganizations of the VPVOS are recounted in Chapter 3, and reviewed in Table 7.2.

Many of the articles in the VPVOS historical literature use historical events in surrogate arguments about current problems and issues. Two types of surrogate arguments may be defined. In the first, the author consciously and fairly explicitly interprets historical events in a manner that is clearly relevant to current issues. This form of surrogate argument is usually quite straightforward and easy to analyze. A second class of argument is more difficult, for the author may be making a relatively minor point in an ongoing debate with which the VPVOS readers may be familiar but outside analysts may not. A third, and very important type of article may not necessarily have a surrogate argument in it at all. Instead it may embody the set interpretation of history prevalent at the time. But even this last class of articles can be very important, for they inform us of organizational viewpoints, perceptions, and interests that may be used to predict probable reactions to new issues.

Table 7.2: Organizational Changes During the GPW[24]

Date	Change
July 41	PVO Zones subordinated to Front Commanders as PVO Administrations[25]
Aug 41	Zones disbanded and all ZA directly subordinated to fronts and armies[26]
Nov. 41	ZA to VPVOS, Commander VPVOS position created
Jan 42	IA forces fully subordinated to VPVOS
April 42	Moscow PVO Front created, Leningrad, Baku Armies
June 43	E and W PVO fronts created, VPVOS subord to Arty Moscow Special PVO army formed
Mar-Apr 44	N, S, Transcaucasus fronts created, numbered Corps and Divs formed from regional units, Deputy Commander of Artillery for PVO position created[27]
Dec 44	N, S PVO fronts changed to W, SW fronts, Central front created in Moscow

Thus, even if one does not accept the argument that the articles examined below are direct surrogate discussions of the reorganization there is still good reason to believe that they represent the VPVOS's organizational viewpoint and interpretation of history. That these arguments remained stable over time suggests that they remained representative of VPVOS viewpoints. Were these interpretations of history to come into conflict with the prevailing views and beliefs of the VPVOS they would be

24 Unless otherwise indicated all this information is from Yerofeyev (1973a).

25 Svetlishin (1973; 96).

26 Svetlishin (1973; 97).

27 Komarov (1975; 86).

changed. Indeed, it is common in Soviet historiography to change interpretations of history to meet modern needs. Just before the reorganization a major but temporary shift in interpretation does take place, strengthening the argument that these historical discussions are relevant to current issues. This shift, discussed in detail in the next chapter is a good example of the exception proving the rule.

In considering the VPVOS's role in the reorganization debate, it is worthwhile first to lay out some of the basic principles that appear to have guided the VPVOS and to discuss some of the difficulties of the Great Patriotic War and their relation to the present.

The issues that arise may be broken down into three broad but not mutually exclusive categories: leadership and organizational structure, resource issues, and interaction and coordination. In turn, each of these categories has certain specific issues that arise and are shared between categories.

7.5.1 Leadership and Organizational Structure

First, and perhaps most fundamental, is the problem of leadership and organizational structure. One of the most basic principles advocated by the VPVOS is centralized control. But centralized control has several aspects to it. First, what degree of centralization is optimal? Should all forces be controlled from one command post in Moscow, or should some degree of decentralization be allowed? Second, how can centralization be combined with effective interaction with other services? For the VPVOS one basic element of centralized control is that the commander be a VPVOS officer controlling VPVOS troops, but this might not lead to the most ef-

fective interaction with other forces. Third, should the same centralized system operate during both peacetime and wartime? Centralized control thus touches on a number of important operational and organizational questions, and not surprisingly becomes a major point of discussion as the VPVOS tried to adjust to its conventional roles and missions.

Throughout the VPVOS literature of the 1960s and 1970s the principle of centralization is accorded great weight, particularly since the organizational history of the VPVOS in the Great Patriotic War is one of a struggle for centralized control of IA and AAA forces.[28] Even after the war the VPVOS in the early 1950s was reorganized and did not take on its (comparatively) permanent form until 1954. The question of centralized control of air defense forces is central to the VPVOS literature and to the service itself.

The advantages of centralization are many. VPVOS authors point out that centralization allowed the rapid maneuver of VPVOS forces to meet enemy concentration, coordination of PVO battles over a wide expanse according to a single plan (anti-air operations), clear lines of command and control, and the most efficient and effective use of forces and resources.[29] But while the importance of centralized control is stressed for the Great Patriotic War, there are indications that the VPVOS considers it even more important, and feasible, with modern forces and equipment. Thus the main advantage of automated troop control systems (ASUs) is to allow more effective processing and transfer of data to enhance cen-

28 See Chapter 3.

29 Zabelok (1968; 21-22), Buturlin and Yakimanskiy (1969), Yerofeyev (1970; 16-17), Batitskiy (1977c; 11).

tralized control.[30] This is particularly relevant to the concept of the anti-air operation, where combat is to be controlled from one master command post.[31]

This stress on centralization of command and control is particularly clear in VPVOS discussions of the beginning period of the war, before the November 1941 reorganization. Criticism of the pre-war organizational structure is fairly uniform throughout the VPVOS literature, with two exceptions that will be discussed below.[32]

The beginning period of the war organization is criticized on several points, all of which appear to be relevant to contemporary concerns. One author notes the following "deficiencies":

> --Incomplete realization of the principle of unified control of PVO forces. IA forces only supported VPVOS.
>
> --Control of PVO Zones was not through an independent organ but through the control apparatus of the Military District.
>
> --The territorial arrangement of PVO did not allow for establishment of set complements of forces.[33]

These criticisms are more directly presented than in some VPVOS articles, but they are representative. It should be noted though, that the beginning period of the war organizational structure closely resembles that adopted in the 1981 reorganization, and many criticisms of the beginning period of the war structure appear to be surrogate arguments against the reorganization. Indeed, the article from which the criticisms above

30 See Bremner (1984), Lepingwell (1986; 24-48).

31 Kalugin (1968; 51), Svetlishin (1977; 89-90), Gorokhov (1988; 1,3), Belenko (1988; 98).

32 Frantsev (1981) and Gorbunov (1980).

33 Strusevich (1978; 35).

were taken appears to be one of the strongest surrogate arguments against the reorganization to appear in the VPVOS literature.

Criticisms of the beginning period of the war seem to take on a special sharpness and greater frequency just before the reorganization, suggesting that they were being used as surrogate arguments.[34] It is also a later article on the beginning period of the war that signifies the reopening of the debate over reorganization in 1984.[35]

Having established the importance of the principle of centralization, we must recognize that complete centralization is impossible and some degree of decentralization must be built into the system. Here the issue of the PVO Fronts and TVD level commands arises. Much of the post-1975 VPVOS literature deals in (repetitious) detail with the creation of the PVO Fronts in June 1943, and this discussion seems directly relevant to the proposed devolution of authority to the TVD commands. The existence of a surrogate argument is fairly clear, as the issues involved are similar and there is a sudden surge in discussion of the PVO Fronts. How should these historical arguments be interpreted?

The PVO Fronts were roughly the same scale as modern TVDs and their disposition was similar to that proposed for TVDs. This might suggest that the discussions of PVO Fronts were arguments for TVD level PVO commands. Such an argument seems plausible, but it is more likely that the VPVOS was arguing for a different system.

First, VPVOS articles stress the importance of centralized control and unified control of all branches under the VPVOS. As opposed to this

34 See Strusevich (1978), Svetlishin (1979), Sozinov (1979).
35 Koldunov (1984b).

a TVD command would centralize control under the overall direction of the TVD commander (a Ground Forces or General Staff officer) rather than under the VPVOS. Service level centralized control of forces would thus be reduced rather than enhanced.

This criticism of the TVD level commands appears to be reflected in the argument emerging late in the 1970s against overly strict Stavka control of PVO forces and in favor of greater authority for the PVO Front commander.[36] A PVO Front system would retain VPVOS resources and control within the service, albeit under the general direction of the Stavka. Such an arrangement would not only retain VPVOS control and independence, but might make for more rapid regrouping and maneuver of VPVOS forces in the event of a strategic threat. Thus, I argue that the discussions of PVO Fronts were not a direct surrogate for the TVD commands established in 1981. Instead, a PVO Front type of organization was being proposed as an alternative to the TVD command as a measure that would improve coordination with the ground forces and PVO SV forces while retaining VPVOS leadership of VPVOS forces.

First, let us look at how the PVO Fronts were portrayed. Two main attributes were stressed: their ability to interact with ground forces on the offensive, and their wide scale of operations.[37] The VPVOS literature uniformly treats the creation of the PVO Fronts favorably. Furthermore, the PVO Fronts were classified as *ob'yedineniy* a term denoting a large scale formation with an operational-strategic scope, similar to that of

36 Svetlishin (1979; 241).

37 See, for example, the discussion in Svetlishin (1976; 42-45).

fronts or TVDs. The advantages of the PVO Fronts are stressed as important parts of the centralized PVO system of command and control.

There is one criticism of the PVO Fronts that emerges in Svetlishin's 1979 book on VPVOS operational art that might well be a surrogate argument directed against the proposed TVD system. Svetlishin complains of overly strict centralization because the PVO Front commander was unable to move forces from defended objectives or determine objectives to be defended without the specific approval of the Stavka. Nor were the PVO Fronts allowed to create significant reserves. This represents a very serious complication in the execution of maneuver and it is curious that it was not mentioned before in the VPVOS literature.[38] While Svetlishin claims the PVO Front commanders were able to accomplish their tasks by careful study of the situation and requests to Stavka to move forces, the Military Soviets of the PVO Fronts several times put before Stavka the issues of reserves and the right to regroup forces. These requests met with no success. Svetlishin quotes a complaint by the South PVO Front Military Soviet to the Commander of Artillery (Voronov) that illustrates the difficulties caused by this strict control:

> The South PVO Front continuously receives requests to designate PVO means for protection of objectives of the rear of the Ukraine front. But we have no reserves at our disposition. Removal of units or podrazdeleniy [battalion or smaller] from the defense of objectives having lost their significance [value] or located in the deep rear, currently can be done only with your decision in each separate case. Such complete centralization in the use of PVO means in the absence of free reserves does not allow timely provision of protection to important objectives, and likewise excludes the maneuver of forces with the goal of strengthening the

38 Svetlishin (1979a; 237, 241).

PVO of certain objectives subject to the systematic actions of enemy aviation...[39]

This quote clearly and concisely indicates the problems associated with the very strict centralized control by Stavka. But Svetlishin does not finish the story--he gives no indication of how this problem should be solved and implies that it was not. The point of Svetlishin's comment is clear: centralized control may have a damaging effect on combat effectiveness if too much control is concentrated at the wrong level. The argument is *not* against centralized control *per se* but rather against overly strict control on the part of Stavka.

Svetlishin's comments may be part of an argument for retaining control within the VPVOS, and widening the authority of the PVO Front commanders, rather than assigning responsibility for these dispositions to the TVD level or to General Staff representatives. This argument is previously unknown in the VPVOS literature and it appears just before the VPVOS reorganization. Furthermore, Svetlishin follows the standard practice of dealing with a sensitive argument: presenting it in the words of a leading Great Patriotic War military figure.[40] In short, Svetlishin's argument is not with the formation of the PVO Fronts, but rather their degree of independence and autonomy.

A second important component of the reorganization that created the PVO Fronts was the subordination of the VPVOS to the Commander of Artillery. While the decision to create the PVO Fronts is widely praised in

39 Svetlishin (1979a; 241). Note that this complaint was sent on May 22, 1944 well after most of the reorganizations.

40 This is the Soviet equivalent of "plausible deniability"-- the author is only quoting what a Marshal said.

the VPVOS literature the subordination to Artillery has received more mixed reviews, as summarized in Table 7.3.

There are two aspects to the interpretation of VPVOS comments on the subordination to Artillery. First, there is a purely historical aspect: the subordination was a step backward from the creation of the VPVOS as a separate service. VPVOS commentators take the issue of independence seriously, and criticisms of this decision have been very harsh. For example, Colonel General Zimin writing in 1965, stated that the subordination had been prompted by "subjective considerations" and did not work out well.[41] A second interpretation, however, begins to emerge towards the end of the 1970s. The subordination to Artillery also represented the partial elimination of the delineation between strategic air defenses (VPVOS) and tactical air defenses (PVO SV).

As such, discussions of the subordination may stand as a surrogate for the combining of these two forces into one service. There is some clear evidence for this, as the two articles (discussed in more detail below) that herald the merger of the VPVOS and PVO SV into the VPVO *reverse* the standard VPVOS conclusion about the advisability of the merger, and claim that it was a great step forward in VPVOS operational art. (See Table 7.3.) It should also be noted that from the PVO SV viewpoint, as expressed by Levchenko and others, the subordination to Artillery brought about a significant improvement in coordination between the two forces and is strongly endorsed.

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41 Zimin (1965; 111). The same comment in made in Yerofeyev (1973a; 88-89), see below.

Table 7.3: Views on the Subordination of the VPVOS to the Commander of Artillery

AUTHOR	Mentioned?	Pro or Con?	Journal
Biryuzov (1961)	N		MT
Zimin (1965)	Y	++Con	MT
Batitskiy (1967)	Y	+Con	Vizh
Batitskiy (1967)	N		MT
Batitskiy (1968)	Y	+Con	Book
Svetlishin (1969)	N		Vizh
Svetlishin (1971)	Y	NC	Vizh
Batitskiy (1972a,b)	N		Vizh
Batitskiy (1972c,d)	N		MT
Yerofeyev (1973a)	Y	++Con	VPVO
Yerofeyev (1973b)	Y	NC	Vizh
Svetlishin (1973)	N		MT
Buturlin et al (1975)	N		VPVO
Komarov (1975)	Y	NC	VPVO
Svetlishin (1976)	N		VPVO
Svetlishin (1977)	N		Vizh
Chedleyev (1977)	Y	NC	VPVO
Strusevich (1978)	Y	+Con	Vizh
Sozinov (1979)	N		Vizh
Klevtsov (1979)	Y	+Pro	VPVO
Svetlishin (1979)	Y	NC	Book
Gorbunov (1980)	Y	++Pro	Vizh
Frantsev (1981)	Y	++Pro	Vizh
Dagayev (1981)	N		Vizh
Yerofeyev (1981)	N		VPVO
Smirnov (1983)	N		Vizh
Koldunov (1985)	N		Vizh
Mal'tsev (1986)	Y	+Con	Vizh

Particularly interesting is the treatment of the issue in two articles by the same author, one published in *Voyenno-istoricheskiy zhurnal* and the other in *Vestnik PVO*.[42] In the *Vestnik PVO* article the subordination is criticized as incorrect and based on subjective considerations, whereas in the *Voyenno-istoricheskiy zhurnal* article the subordination is noted but

42 The *Voyenno-istoricheskiy zhurnal* article is a shortened version of the previously published *Vestnik PVO* article, see Yerofeyev (1973a,b).

not commented upon.[43] The omission of this criticism suggests the possibility that the formulation on subordination was already a sensitive issue and that controversial service-oriented statements were being censored from *Voyenno-istoricheskiy zhurnal*. Indeed, Batitskiy's last critical comment on the subordination was issued in 1968, and after that time he avoided comment on the subject.[44] The last critical evaluation of this action in the pre-reorganization VPVO literature was in 1978.[45] There then follows a long period of silence on the issue, until after the reversal of the reorganization in 1986 when the Chief of the Main Staff, Col. Gen. I. Mal'tsev criticized the subordination as a negative development.[46] This evidence strongly suggests that the historical event of subordination to Artillery became a surrogate for the merging of strategic and tactical air defenses. On this issue it is interesting to note that it was only a low-ranking officer (Colonel Strusevich) who explicitly criticized the subordination before the reorganization, while higher-ranking officers either ignored it (often when it was directly pertinent to the issue under discussion) or only mentioned it in passing. It may well be that this issue was too controversial for high-ranking officers to discuss in public, and that lower-ranking officers were designated for this task.[47]

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43 Yerofeyev (1973a; 88-89), (1973b; 61-62).

44 Batitskiy (1968; 201, 341). See Table 7.3 for his later omissions.

45 Strusevich (1978; 39). Th phrase "subjective considerations" is particularly harsh and refers to Stalin's arbitrariness. Strusevich's argument is that it simply added to the workload of the Commander of Artillery and that the reorganization did not improve effectiveness while it set back the VPVOS on the road to independence.

46 Mal'tsev (1986; 26-27, 31).

47 This practice of using "mouthpieces" has a long history in Soviet defense debates.

Thus the criticism of the subordination to the Commander of Artillery strongly suggests that the VPVOS opposed the combination of PVO SV and VPVOS forces into one PVO structure. This interpretation runs completely counter to the viewpoint of the PVO SV, discussed below.

To sum up, while centralized control is valued throughout the Soviet Armed Forces, the VPVOS interpretation of this principle had some particular nuances. It went beyond the issue of simply centralized leadership to include the clear delineation between tactical and strategic PVO, and implied that the centralized control should be under a VPVOS officer. PVO Fronts appear to be one potential means of ensuring such centralized control, but only if they are vested with sufficient authority to maneuver their forces and respond rapidly to the changing situation. All of these views, however, run counter to the 1981 reorganization and suggest that it was not endorsed by the VPVOS. These issues of control are also closely intertwined with the second category of issues addressed in the VPVOS literature: resource issues.

7.5.2 Resource Issues

For the VPVOS the distinction between operational control of resources and ownership of resources is an important one. This is very clear in the case of Fighter Aviation which at the beginning of the war was supposed to be controlled by the VPVOS even though its forces were owned by the Soviet Air Force. Even after the November 1941 reorganization that formally subordinated IA forces to the VPVOS the problem of dual control was not fully solved.[48] While the actual aircraft were sub-

48 See Svetlishin (1973a; 97-98) for one of the earliest criticisms along these lines.

ordinate to the VPVOS, the maintenance and supply systems were subordinate to the air forces of the military districts and fronts:

> Air Force Commands of the districts and fronts deployed rear [service] units only in the interests of their own troops, sometimes leaving [VPVOS IA] regiments without service. Such types of quarrels in control and support of aviation units designated for PVO of objectives of the rear of the country led to the disorganization of their combat activities and lowered the effectiveness of the PVO of the country as a whole.[49]

The above quote is revealing, for it very clearly indicates the existence of interservice competition for resources during the most acute period of the war. While this runs counter to the generally accepted (and promulgated by the Soviets) view of the Soviet military as a very carefully and precisely run machine, it should not be surprising. Under conditions of extreme resource constraints, very difficult missions, and severe repercussions (both military and personal) for failure, the incentives to retain control of all available resources become extremely strong. The Soviet Air Force, greatly outnumbered and faced with the need to provide ground and air support for the troops in the Battle of Moscow, was understandably reluctant to give up control of its scare forces and therefore it engaged in organizational attempts to retain control and to fend off the VPVOS.[50]

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49 Chedleyev (1977; 82).

50 It is also worth noting that the subordination of IA to the VPVOS did not take place until after the worst of the Battle of Moscow was over, and after German air strikes had tapered off. The reason for this is unclear, perhaps during the actual battle the upper command and control levels were too overloaded to deal with Air Force-VPVOS resource problems. More likely, however, is that the lessons of the Battle of Moscow took a while to be learned and that the reorganization was decided upon in order to bolster VPVOS defenses against an expected Spring bombing campaign. While VPVOS sources do not refer to any such expectation, given the disposition of German troops and aircraft near Moscow such an expectation would not be unreasonable, particularly since the Soviets were expecting a renewed ground campaign against Moscow. This would also explain the April 1942 formation of the Moscow PVO front. See Werth (1964; 389-90).

It was this problem of dual subordination that was resolved by the January 1942 reorganization that completely transferred IA to the VPVOS, including the airfield support battalions that had previously been subordinate to the Air Force.[51] The subordination of IA to the VPVOS greatly eased IA command and control problems for the VPVOS and the historical discussions concerning IA clearly indicate the importance to the VPVOS of the ownership of all forces designated for PVO by the VPVOS. Operational subordination is regarded as insufficient, as the service with ownership will still try to impose its own missions on the forces.[52] This argument has direct repercussions for the TVD reorganization that removed significant IA forces from central VPVOS control and ownership. Beyond the fact that this reduced overall VPVOS forces (and hence capability), even if they were to be operationally subordinated to the VPVOS in some cases this would still represent a situation very much like that prevailing in the beginning period of the war. Indeed, the argument by Chedleyev quoted above appears in 1977 at a time when deliberations on possible VPVOS reorganization were probably already underway, and it may well be a direct criticism of the proposals.

Other resource control issues are also raised by the VPVOS, particularly the issue of logistics. The importance of central control of rear and supply units is emphasized later in Chedleyev's article as he points out that the Spring 1944 reorganization of the VPVOS also centralized and subordinated all supply (except for food) under the VPVOS.[53] In November

51 Svetlishin (1973a; 98).

52 Chedleyev (1977; 82), Svetlishin (1973a; 97-98).

53 With the exception of the Transcaucasus PVO Front which received its support through the Ground Forces Front.

1944 other rear support units (e.g. hospitals, depots, workshops) were transferred to the VPVOS. Chedleyev claims that this had a positive effect on the support of troop combat readiness.[54] These steps to include more support forces under the VPVOS suggests a recognition both that they were not well served by the Ground Forces fronts (which probably gave priority to ground combat forces) and were a further step towards establishing the VPVOS as a self-sufficient service.

Thus the importance of service control and ownership of all elements essential to its combat performance is stressed, from fuel to hospitals. This tendency to "vertical integration" is clearly related to similar tendencies in other organizations.[55] By achieving such integration the service increases its control over the environment and reduces risk and uncertainty, as it no longer has to rely on external organizations with other goals and values. While we do not know if VPVOS logistics were reorganized in 1981, it is quite possible that a centralization of TVD logistics took place that might have reduced VPVOS control over its own supplies. Even if that were not the case, however, the preference for both control and ownership of all combat and support resources is clearly represented in the VPVOS literature.

There is also the question of resource control in the transition from peacetime to a war footing. Before the reorganization the VPVOS appeared to operate under the same command and control structure in peacetime as during wartime, in keeping with its stress on high combat readiness. However, it seems that under the reorganization the military

54 Chedleyev (1977; 84-85).
55 Thompson (1967; 29-37).

districts have peacetime administrative control over VPVOS resources, while during wartime (or mobilization) the TVD commands (or perhaps even Ground Force Fronts) would take over operational control.[56] It therefore appears that some time would be required for a full transition from peacetime to wartime command and control structures. Any such lag (with possible confusion as well) would reduce the combat readiness of the VPVOS, and with the growing emphasis during the late 1970s on the danger of surprise air attack this was viewed as a significant problem.[57]

Overall, resource issues indicate a VPVOS preference for both ownership and control of all necessary resources in both peacetime and wartime. This is in keeping with the twin demands of centralization and combat readiness that play such an important role in VPVOS operational art. Once again, this set of views is both consistent with VPVOS organizational interests and in conflict with the reorganization.

7.5.3 Interaction and Coordination

The third category of issues, interaction and coordination, is related to the questions of centralization and resource control but has more direct operational and tactical significance.[58] VPVOS authors stress four developments that enhanced interaction: the creation of PVO Fronts, the formation of operational groups, joint warning systems, and joint planning and tactics. Of these, the PVO Fronts have already been examined. Their

56 See the discussion of the KAL 007 incident below.

57 Mil'chenko (1971), Nikolayev (1979), Gromov (1976), Batitskiy (1977; 4), Mal'tsev (1979), Koldunov (1981; 8).

58 Here we are mostly concerned with inter-service interaction but a great deal of attention is also paid to the problems of inter-branch interaction in the VPVOS literature.

creation was accompanied by a redrawing of PVO boundaries to establish a closer correspondence between PVO corps and divisions and the corresponding SV formations (Fronts, armies).[59] This change allowed closer coordination between the two forces by avoiding the need to coordinate between several different commanders and forces.

Operational groups were presented by the VPVOS as the key to ensuring coordination between VPVOS and PVO SV units defending the same target. Often up to a division in size, these groups would be formed from the staffs of the PVO Fronts. Although the operational groups do not appear to have been given operational control over PVO SV forces they were intended to coordinate closely on the defense of the assigned objective, and their command posts were sometimes co-located with those of the PVO SV.[60] The operational groups were first established at Kursk, and were extensively used throughout the later part of the war.[61] Indeed, the operational groups appear to be the main VPVOS solution to the problem of interaction--joint forces are to be formed at the tactical or operational level as necessary, not at the service level by an organizational merger.

Where operational groups were not employed the VPVOS, PVO SV, and the Soviet Air Force acted in echelons, with the PVO SV and the Air Force providing cover for the battlefield and the immediate rear while the VPVOS covered targets towards the rear of the Front, particularly LOCs. This system is not as simple as it sounds, however, for coordination and

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59 Sozinov (1975; 22).

60 Sozinov (1975; 22), Svetlishin (1976b; 43-44), Yerofeyev (1980; 72). Note that this is a different arrangement from that of Stalingrad, where VPVOS forces were actually placed under the command of the SV Front commander.

61 Svetlishin (1972; 25-26).

delineation of the two echelons demanded a good deal of planning and cooperation. From Soviet descriptions of this coordination there appear to have been some major difficulties.

First, there was the problem of coordinating separate air observation and warning systems. The PVO SV deployed its own warning system (VNOS) to provide warning and target information to its own batteries and the VPVOS had its own system (including radar). This duplication resulted in some predictable problems, including maldeployment of warning forces, gaps in coverage, failure to pass on warning, and so forth.[62] In addition the VPVOS had its own problems with establishing warning coverage because its advance warning units would outrun communications lines.

Several steps were taken to reduce these warning problems. VPVOS commentators mention the creation of joint warning systems integrating PVO SV and VPVOS forces (or at least sharing their data) as a great improvement in PVO efficiency. To solve the problem of communications the VPVOS developed radiobattalions during the last years of the war--warning posts equipped with powerful radio stations for rapid and direct communications.[63] But despite these measures some very basic problems were never solved. For example the Air Force and VPVOS never developed a system for

62 Most articles simply note that joint warning was established, for some more detailed and critical comments see Bednenko (1977; 16), Botin (1979; 77), Smirnov (1978; 34-35). On the maldeployment of VNOS forces see Svetlishin (1965; 35-36), Yerofeyev (1980; 75-76). It is often noted that problems in warning and coordination resulted in the poor defense of Gor'kiy, Saratov and Yaroslavl' in June 1943. See, for example, Sozinov (1979; 24), Yerofeyev (1973a; 61), Batitskiy (1972; 24), Strusevich (1978; 38).

63 See Svetlishin (1977d; 114), Yerofeyev (1980; 75-76). It is a measure of the fairly low level of electronics use that this measure took place fairly late in the war and is considered a major technological breakthrough.

transferring targets between the two forces. It would therefore appear that a target located by the Air Force would have to be re-located by the VPVOS before it could be intercepted.[64] This suggests a rather low level of coordination between the two systems. It further appears that for the most part Air Force and VPVOS aircraft operated in completely separate zones in order to avoid mistaken attacks on friendly forces.[65] Other reports of interaction problems suggest that in some locations this delineation of zones caused major problems, and that forces were integrated on a case-by-case basis.[66] Overall, though, there seems to have been relatively poor communication between the services.

VPVOS authors do note the importance of joint planning between the services, but their examples are rather simple: joint documents and regulations, establishment of joint recognition symbols, and delineation of zones of action. While the forces were indeed able to interact, the stress seems to have been on separate zones of action in almost all cases.

This is quite different from the smooth "combined arms" performance that one might expect from a highly centralized leadership. In fact, the stress on centralization may have had a deleterious impact on inter-service interaction, as it forced even routine problems to be sent to the top for authorization. One example may serve to illustrate the problem. At Budapest the PVO forces blockading the city needed to move a searchlight company to allow PVO SV forces to fire on German night flights. To accomplish this the Deputy Commander for PVO of the SV Front requested

64 Buturlin and Mosevkin (1976; 91).
65 Grishkov (1974; 31).
66 Komarov (1980).

the move from the VPVOS main staff, and receiving their agreement informed the VPVOS Corps commander. The VPVOS Corps Commander could not make the decision and requested a decision from the South-West PVO Front Commander who approved the redeployment of the searchlight company. This process took three days.[67] While the authors who note this problem propose operational groups as the solution it is clear that the principle of strict centralization had its inefficient aspects.

Another major problem experienced during the war was the appearance of gaps between the VPVOS and PVO SV. While in many cases these gaps were due to inadequate logistical support for the VPVOS (in some cases Stavka had to intervene to order additional transport) there also appear to have been lags associated with the authorization needed to move forces from the objectives being defended. There are reports that gaps of up to 300 km occurred.[68]

In facing the problems of interaction and coordination in modern conventional warfare the VPVOS undoubtedly ran into these same problems, with new technologies easing some aspects and complicating others.[69] The 1981 reorganization was one attempt to solve the interaction problem by concentrating the control of all PVO and Air Force assets at one command

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67 Slezkin and Mosevkin (1984; 84). Note that they do not mention whether the PVO Front commander obtained permission from the General Staff, although earlier in the paragraph they state that such permission is necessary.

68 Many authors note that attempts were made to prevent gaps from arising between the VPVOS and PVO SV, but few are specific on this problem. See Botin (1979; 77), Gorbunov (1980; 25-26), Dagayev (1981; 30).

69 For example the problem of identification friend-or-foe (IFF) has become much more acute in an era of long-range missiles, as the Egyptians discovered in the 1973 war when they lost a significant number of aircraft to friendly SAM fire.

level--the TVD. Whether such a system would have solved the problems experienced during the Great Patriotic War is unclear--certainly it would have streamlined the control system and lines of authority. It would also reduce the problem of interaction by pushing back the interface between aircraft in the Military District Air Forces and the VPVOS IA to within the borders of the USSR, thereby reducing the need for interaction against most tactical targets. But while the TVD level commands might ease interaction with other services, interaction does not appear to have been a major concern of the VPVOS. Most articles imply that the Great Patriotic War system was largely successful, and that the operational group was the basis for effective coordination.

In all three of these areas, leadership and organizational structure, resource control, and interaction, the VPVOS's viewpoints were largely opposed to the concepts embodied in the 1981 reorganization. Where the VPVOS preferred centralized control at the national level, with a clear delineation between VPVOS and PVO SV forces, and complete ownership and control of all VPVOS forces, the 1981 reorganization went against all of these principles. On the basis of all of these categories, then, there is good reason to believe that the 1981 reorganization was not welcomed by the VPVOS. The 1981 reorganization embodied many of the same characteristics of the 1941 organizational structure that had been so consistently condemned by VPVOS commentators, and these criticisms continued after the organization as well.

In contrast, the PVO SV held very different views, particularly in the area of interaction, and these were more consonant with the reorganization. They are examined in the following section.

7.6 PVO SV Viewpoints

The PVO SV has a much different mission and history than the VPVOS and consequently has developed quite a different conception of the role of PVO forces and their effective deployment.[70] This conception is revealed largely through the historical literature on the PVO SV, which although less voluminous than for the VPVOS, is still very revealing of its organizational interests and viewpoints.

The PVO SV literature shares several common themes with that of the VPVOS, such as the importance of massing, concentration, and the search for an optimal organization structure, but there are also many differences in topics and perspective. Thus, the PVO SV literature strongly emphasizes the weakness of the PVO SV forces existing at the beginning of the war, and implicitly (and occasionally explicitly) criticizes resource allocation between PVO SV and VPVOS. The perspective on interservice interaction is also different, with the PVO SV particularly critical of the Air Force in the early period of the war and some implicit criticism of PVO SV--VPVOS. Throughout, the perspective of the VPVOS historiography is more closely tied to that of the ground forces than the VPVOS. Some of the key issues in VPVOS historiography are examined below.

First, the VPVOS portrayal of the beginning period of the Great Patriotic War is very different in emphasis than that of the VPVOS. Whereas VPVOS authors discuss problems of organizational structure and

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70 The term PVO SV is properly applied only after the troop air defense forces became a branch of the SV in the late 1950's. For convenience, however, I will apply it to ground force air defense troops during the Great Patriotic War.

command and control problems, PVO SV authors tend to highlight the lack of AAA forces throughout the army.[71] Indeed, many PVO SV authors argue that sufficient AAA forces were not available until after the battle of Stalingrad in the Fall of 1942. As pertains to organizational structure, the November 1941 reorganization of Soviet air defenses that created the delineation between the PVO SV and VPVOS is sometimes criticized for reducing PVO SV force levels even further.[72]

Second, the issue of organizational structure is quite important, albeit on a tactical scale. After the November 1941 reorganization, PVO SV forces had no centralized leadership until the summer of 1942 when all PVO SV units were subordinated to the Commander of Artillery of the Armed Forces and the post of Deputy Head of Artillery for PVO was created. Army PVO regiments were also created, unifying some of the disparate PVO units, and increasing the concentration of fire.[73]

Third, the principle of massing of forces was of great importance to the PVO SV, reflecting their artillery heritage. Thus, in October 1942 the State Defense Committee ordered the creation of zenith artillery groups (AAA groups), incorporating 1/2 to 1/3 of the AAA forces of the army or front. Army level AAA groups were to be commanded by a deputy commander of artillery for PVO.[74] Along with the creation of AAA groups, special Reserve Divisions of the Supreme High Command (RVGK) were created that could be assigned to armies or fronts in particularly active areas.

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71 Tur (1962; 15-16), Desnitskiy (1963; 13-16), Lavrent'yev (1971a; 30), Lavrent'yev (1972; 25-26).

72 Lavrent'yev (1972; 26)

73 Tur (1962; 19), Lavrent'yev (1972; 26-27).

74 Tur (1962; 19), Desnitskiy (1963; 22), Lavrent'yev 1972; 28).

Like other reserves these were under the direct command of the Stavka. These reserves allowed massing and the creation of very high AAA densities along sections of the front involved in breakthroughs or to defend river-crossings.[75]

Fourth, there is the issue of resource allocation between the VPVOS and PVO SV. While this is never addressed directly and explicitly, a close reading of the PVO SV literature reveals a clear annoyance with the priority given to the VPVOS during the early period of the Great Patriotic War when resources were very scarce. The primary example of this is the allocation of all production of mid-calibre 85 mm AAA guns to the VPVOS and anti-tank units until early 1943. This lack of mid-calibre AAA severely hampered the PVO SV for it allowed German aircraft to overfly the small calibre AAA and strike with impunity.[76] Radar stations also appear to have been assigned first to the VPVOS, although this case is not as clear.

Fifth, and finally, the PVO SV and the VPVOS appear to have very different interpretations of their interaction during the war. This issue is examined in detail below. One particular concern of both was the PVO SV forces outrunning the VPVOS forces creating a large gap in the defenses.[77]

It should be noted that in general the PVO SV pays little attention to the VPVOS (and vice versa) in the historical literature and interaction is often described in a pro-forma manner. This point will be discussed in

75 Tur (1962; 20, 22), Levchenko (1976; 37), Chesnokov 1983; 29-30).
76 Tur (1962; 19-20), Desnitskiy (1963; 15-16, 18, 22).
77 Tur (1962; 23),

more detail in later sections, but it should be pointed out that in most of the major offensives of the last period of the war the PVO SV forces played a much larger role than the VPVOS. Indeed, just by comparing the total number of aircraft destroyed during the war by the two forces (PVO SV: over 21,000, VPVOS: 7313) one gets a relative estimate of their importance during the Great Patriotic War.[78]

Thus, while there are some points of congruence between the VPVOS and the PVO SV there are also some clear divergences and even indications of a muted rivalry.

The clearest and most authoritative statement of the divergent views of VPVOS--PVO SV interaction and organization was presented by Colonel General P. G. Levchenko, the Commander of the PVO SV, in a rare appearance in *Vestnik PVO* in September 1976 as part of a short historical series examining VPVOS interaction with other services during the Great Patriotic War. Levchenko's article is harshly critical of the interaction of VPVOS and PVO SV forces and has clear relevance to contemporary issues.

Levchenko's framework of analysis is a chronological overview of the development of VPVOS--PVO SV interaction, similar to that of some VPVOS articles. In analyzing the first months of the war (before the November 1941 reorganization) Levchenko states that Ground Forces Front control of AAA forces resulted in a very effective use of the available resources for front defense. Lines of authority were clearer and Ground Forces commanders could maneuver and assign forces as the situation demanded. All available forces were used for front echelon PVO and the unified warning

78 These numbers are probably somewhat inflated, and their ratio is more important than their absolute values. Levchenko (1976a; 38), Batitskiy (1972a; 29).

and fire control systems were effective.[79] Compared to the VPVOS descriptions of misallocated forces and ineffective use Levchenko's argument is almost exactly the opposite.

In describing the November reorganization that transferred AAA forces to the VPVOS, Levchenko emphasizes the negative effects of stripping the majority of AAA from the fronts for rear area defense.[80] Levchenko further implies that this reorganization was the *start* of the organizational and interaction problems: "From this time the interaction between the VPVOS and PVO SV became one of the complicated operating [operational] measures in the system of PVO in the frontal [prifrontal] zone."[81] Thus, the organizational advance hailed by the VPVOS authors is treated as a large step backwards, complicating the command and control of PVO.

According to Levchenko, the principal problem with the reorganization was that it gave responsibility for LOC and rear area defense to the VPVOS, which did not fall under the direct control of the Ground Forces Front commanders. The Ground Forces Front commander had to send requests and petitions to the VPVOS for VPVOS forces to screen his LOCs and rear areas rather than designating his own forces for this purpose. If VPVOS forces were not forthcoming or were insufficient then the Front commander

79 Levchenko (1976b; 77).

80 Levchenko points out that the reorganization stripped the fronts of 97% of their AAA regiments, 71% of the detached mid-calibre AAA battalions, 60% of small-calibre AAA, 50% and 40% of the detached mid-calibre AAA and small-calibre AAA batteries respectively, and the majority of anti-aircraft machine gun and VNOS (warning) units. See Levchenko (1976b; 78). Given what we know from Lavrent'yev's work on the poor state of AAA at the beginning of the war this action must have denuded the troops of almost all their PVO forces at a crucial point in the Battle of Moscow.

81 Levchenko (1976b; 78).

had to stretch his own PVO SV forces to cover the objectives.[82] These PVO SV forces then had to be coordinated with any VPVOS forces protecting the objective, usually through the formation of a unified group of forces subordinated to a commander agreed to by the two (VPVOS and PVO SV) commands. It appears that the VPVOS had primary responsibility for target designation in the frontal rear while the PVO SV coordinated the plan for the actual PVO in accord with force dispositions.[83] This form of interaction appears complicated and unwieldy. The unified groups that Levchenko refers to appear to be the same as the operational groups praised by the VPVOS, but here they are presented as inflexible hybrids of the two control systems required by an unwise delineation of PVO tasks.

Levchenko goes on to stress the need for maneuver of PVO SV and VPVOS forces during offensives and the importance of rapid exchange of information concerning the air situation. The defense of large cities at the front lines (e.g. Moscow, Stalingrad) is presented as the best example of interaction between the two forces, for then the VPVOS was already designated to defend the city and its LOCs, so by default it screened the frontal rear.[84]

The reorganization of the VPVOS into two fronts and subordination to the Commander of Artillery is also reinterpreted. Unlike VPVOS commentators Levchenko notes that the subordination increased the interaction between the VPVOS and the PVO SV, pointing out that they even worked together in one building. This also allowed the resolution of some ques-

82 Levchenko (1976b; 78).

83 Levchenko (1976b; 78). Levchenko is very vague on the exact delineation of VPVOS and PVO SV responsibilities.

84 Levchenko (1976b; 79).

tions of the movement of small PVO forces within the Commander of Artillery structure.[85]

The advantages of the VPVOS reorganization were allegedly proved at the battle of Kursk. Unlike VPVOS historians Levchenko claims that the VPVOS was unable to designate sufficient forces to protect the LOCs and that an equal quantity of PVO forces was assigned from the fronts to protect LOCs. This also required close coordination with VPVOS units acting in the same area.[86]

As the Soviet offensive gained speed the problem of providing interaction between the advancing PVO SV and VPVOS units defending the rear was addressed by the Spring 1944 reorganization of the PVO Fronts. Levchenko welcomes this reorganization and cites the blockade of Breslau as another example of successful interaction.[87] But Levchenko claims that at Stalingrad and Kerch the results of mixing VPVOS and PVO SV forces in one combat order had proven unfavorable, so at Breslau the forces were assigned to separate areas of the blockade.[88] This almost offhand comment again suggests that the coordination of these forces had not been smooth and that the preferred solution was to keep the forces distinct so as to prevent confused and mixed command and control.

Levchenko also looks at the final offensive on Berlin, and particularly the PVO of the Oder rivercrossing as an example of interaction. Here again he presents some implicit criticisms of VPVOS performance and

85 Levchenko (1976b; 79-80).

86 Levchenko also cites the battle of Tamansk as an example of good coordination between the two forces. Levchenko (1976b; 80).

87 Levchenko (1976b; 80-81).

88 Levchenko (1976b; 81).

suggests that the disposition of forces was suboptimal.[89]

Having presented mixed examples of interaction, Levchenko goes on to an overall assessment of the Great Patriotic War experience. Levchenko notes two main reasons for the problems of interaction: untimely information on the air situation, and the planning of PVO in two different systems, often without taking into account the interacting forces and means and their tasks. Consequently, there were places where enemy aircraft were allowed to pass through, firing on friendly forces, and saturation of warning posts in one area while there were none in others.[90]

Levchenko also goes on to make comments that, while not direct, are even more important as they concern organizational structure and interaction. His position on the separation of PVO SV and VPVOS is unusual: Levchenko observes that the *concept* of a clear delineation between VPVOS and PVO SV forces was correct but that this concept was not realized before the end of the war.[91] This is tantamount to saying that the separation was a bad idea, or at least that it was poorly executed. Levchenko's further comments strengthen this argument. The PVO SV had responsibility for rear area defenses but not the forces to cover them, so VPVOS forces had to remain in the rear areas to defend them. Thus, responsibility was laid on the SV commander who had no forces directly subordinate to him in order to carry out the mission--a clear recipe for command and control

89 Levchenko (1976b; 81-82).

90 Levchenko (1976b; 82). Surprisingly, for these criticisms Levchenko cites Svetlishin's 1965 article on the third period of the war. See Levchenko (1976b; 82), Svetlishin (1965; 36). But while Svetlishin was fairly critical of the interaction he is generally approving of the VPVOS command structure particularly the 1944 reorganization.

91 Levchenko (1976b; 82).

problems.[92]

According to Levchenko, attempts to improve interaction by experimenting with subordinating VPVOS forces to the Ground Force Front commands (Stalingrad, Don front) failed because the subordination was incomplete. The Ground Forces Front was able to worry about (*zabotit'sya*), warn and coordinate their actions but was not given the right to maneuver or redeploy the VPVOS forces or assign them tasks. These were carried out according to the VPVOS's own plan. To complicate matters further, even the VPVOS Corps commander could not respond to the Ground Forces Front requests, for they had to be approved by the "central organs" (the VPVOS staff or even the General Staff).[93] This system did not allow for clear and flexible control of the forces. The conflicts over jurisdiction, need to appeal to higher authorities, and overly strict centralization appear to have seriously hampered command and control in Levchenko's view. Even in those cases where this joint subordination was not attempted Levchenko implies that many of these coordination problems (particularly the need to clear everything through central organs) would have remained.

Sounding one positive note, Levchenko states that the reorganization of the fronts in 1944 eased the situation by freeing up more VPVOS units from the deep rear of the country and easing their maneuver. This echoes the standard VPVOS appraisal of the 1944 changes. Levchenko then adds, however, that the unification of VPVOS and PVO SV (under the Commander of Artillery) played a significant role in easing the interaction.[94] As we

92 Levchenko (1976b; 82).
93 Levchenko (1976b; 82).
94 Levchenko (1976b; 82).

have seen, this statement is anathema to the VPVOS, directly contradicting the standard VPVOS argument that it must be centralized and independent.

Finally, Levchenko hints at the contemporary significance of his article, clearly stating that at present the role of PVO is to support ground operations, and the functioning of the state and its economy. This is in itself a reversal of the usual VPVOS priorities, but Levchenko takes it further noting that given the increased threat the PVO requires even closer, more rational and fast acting interaction of PVO forces than in the Great Patriotic War, and that this must be considered as part of the problem of PVO as a whole.[95]

Levchenko's article appears to be a critical one in the debate over organizational structure. It sets forth a view clearly at variance with that of the VPVOS that reflects a PVO SV. Its points of divergence are major and striking. But what points was Levchenko making in respect to the contemporary situation?

First, note that nowhere does Levchenko extol the virtues of centralization. The article stresses throughout the need for flexible local control of PVO resources in the interest of the Ground Forces commander. The need to constantly consult higher staff organs for permission to move forces (particularly those of other services) is presented as a clumsy time-consuming system.

Second, the delineation between PVO SV and VPVOS forces, lauded by the VPVOS, is almost condemned by Levchenko. His complaint has less to do with the existence of the VPVOS (although he implies there was no need to create it in the first place) than with its role in the frontal rear.

95 Levchenko (1976b; 82).

Levchenko implies that PVO of all frontal LOCs and rear area targets should have been the responsibility of PVO SV forces under the control of the Ground Forces Front commander. Such an arrangement would provide flexible local control and avoid the problem of dual subordination of forces and interaction. Indeed, the logical corollary of this argument is that VPVOS forces should have been transferred back to the PVO SV after the threat to the rear areas of the country ceased.

Third, Levchenko endorses the subordination of the VPVOS to the Commander of Artillery. In doing so Levchenko again implicitly questions the need for the VPVOS as a separate service and implies that questions of interaction with the Ground Forces Fronts and PVO SV were of primary importance.

Overall, Levchenko's analysis suggests that the system of PVO SV and VPVOS interaction in the frontal rear areas was unsatisfactory. In its place, Levchenko appears to be arguing for a less centralized, but unified, PVO force that would have control over all PVO forces in the frontal area (or by analogy, TVD). The VPVOS would then be relegated to its main mission of defense of the territory of the country, rather than involving itself in frontal defense. A unified command for this purpose is not ruled out, and Levchenko's enthusiasm for the subordination of the VPVOS suggests that he was in favor of a possible unification of VPVOS and PVO SV. (One may speculate that Levchenko would be in favor providing he received responsibility for the control of all the PVO SV forces, including those transferred from VPVOS control.) All these points emerge fairly clearly and strikingly from Levchenko's article and they bear a close resemblance to the VPVOS reorganization of 1980-81. Thus, it appears that

Levchenko was an outspoken supporter of this reorganization, or at least of a preliminary variant that would incorporate the ideas noted above.

While Levchenko was outspoken in *Vestnik PVO* in an article published in *Voyenno-istoricheskiy zhurnal* in the same year he largely avoids the question of interaction between the VPVOS and PVO SV.[96] Levchenko does pay some lip service for the need for close interaction with the VPVOS, but says nothing substantive.[97] Levchenko appears to have chosen to use the *Voyenno-istoricheskiy zhurnal* article to promote the achievements of the PVO SV, while addressing questions of concern to PVO forces in a more restricted and limited forum. Furthermore, Levchenko's article is more focussed on problems of interaction with Air Force fighters and he may have wished to address these issues separately.

Levchenko also did not criticize VPVOS performance in an August 1978 *Vestnik PVO* interview.[98] Levchenko is quite circumspect and does not repeat his criticisms of VPVOS--PVO SV interaction. But he does restates some of the PVO SV's views on issues of interest to both forces. First, Levchenko attributes most of the problems of the beginning period of the war to the economic problems of the 1930s and insufficient arms production, rather than criticizing the organizational structure, a position consistent with Levchenko's earlier views.[99] Second, in response to a

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96 Levchenko (1976a).

97 Indeed, in one oblique reference to LOC defense he claims that from October 1944 to May 1945 there were only 145 Luftwaffe attacks (1120 sorties) against trains and railway stations. See Levchenko (1976a; 36). This suggests that the VPVOS role in the final period of the war was minimal or that at best it served a deterrent function.

98 Levchenko (1978). The interview was in honor of the 30th anniversary of the creation of the PVO SV as a separate branch of the SV.

99 Levchenko (1978; 85-86).

question concerning measures taken to improve the effectiveness of the PVO, Levchenko ignores the November 1941 reorganization completely (since from the PVO SV viewpoint it didn't increase PVO effectiveness).[100] These omissions further indicate that the PVO SV had a very different interpretation of the Great Patriotic War experience.

More unusual was the publication in the July 1979 *Vestnik PVO* of an article by Colonel Klevtsov on PVO SV development during the Great Patriotic War, only the second such article in the 1970s.[101] First, Klevtsov criticizes neither the organization of PVO during the beginning period of the war nor the November 1941 reorganization of the VPVOS. Instead, he notes that while the VPVOS was given centralized control in the November 1941 reorganization that the PVO SV had to wait until June 1942 for a similar centralization of control.[102] Second, Klevtsov endorses the subordination of the VPVOS to the Commander of Artillery in June 1943. Klevtsov's reasons for approving the subordination are similar to those of Levchenko, for he claims that it prevented VPVOS assets from being "frozen" in areas unreachable by enemy aviation. The reorganization also allowed easier maneuver of forces and interaction with the PVO SV. But Klevtsov points out that even after this change the VPVOS and PVO SV still retained their separate command structures and acted independently.[103] Levchenko, on the other hand, emphasizes the importance of close interaction with the PVO SV as the primary reason for the subordination.

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100 Levchenko (1978; 86).

101 Klevtsov's service affiliation and position are not known. He is a candidate (later Doctor) of historical science, and is also co-author of an article in *Vestnik PVO* in 1985 on Frunze.

102 Klevtsov (1979; 73).

103 Klevtsov (1979; 74).

Klevtsov pays less attention than Levchenko to interaction between the VPVOS and PVO SV, instead concentrating on a relatively standard history of the PVO SV forces. But Klevtsov's article does seem to represent a PVO SV viewpoint in its treatment of the November 1941 reorganization and the subordination to Artillery. The publication of such an article in *Vestnik PVO* is very unusual, and it may have been intended as an indicator of changes to come. The observation that the PVO SV and VPVOS retained their independence after their subordination to Artillery may be an indication that a similar independence would be accorded the two command structures if they were merged into one service, as was done in the 1980-81 reorganization.

In the same year three authors (Andersen, Drozhinin, Lozik) under the "general direction" of Levchenko published a detailed study of the history and current state of the PVO SV.[104] For the most part the book follows the standard PVO SV line, ignoring the November 1941 reorganization, extolling the virtues of AAA groups and centralized control through the artillery apparatus, and largely ignoring the VPVOS.[105] In examining the lessons of PVO interaction in the Great Patriotic War, however, the authors provide their own illuminating quote, taken from Marshal Zhukov. Zhukov states emphatically that the SV Front must have the necessary PVO means to defend all of its objectives right up to the rear of its area and he criticizes the dual division of PVO (VPVOS and PVO SV) as artificial and incorrect.[106] This quote appears from almost nowhere, as there is

104 Andersen is a fairly high ranking PVO SV officer, A. I. Drozhinin and P.M. Lozik are probably also PVO SV officers. This book received a good review in *Vestnik PVO* in 1980, see Yerofeyev (1980b).

105 Andersen et al (1979; 43-48).

106 Andersen et al (1979; 55).

little discussion of interaction before it, and it is striking in its forthrightness and clarity. Furthermore, the authors do not make any editorial comment on the quote, letting it stand by itself. Such a presentation strongly suggests that this quote is a reflection of the PVO SV position on the delineation of targets in frontal areas. Unified control under the PVO SV of all forces acting in the frontal area is clearly endorsed, while the system touted by the VPVOS as highly effective is condemned.

There is little additional discussion of interaction during the Great Patriotic War, but the treatment of current problems of interaction clearly indicates that the VPVOS will screen some objectives in the frontal rear and troops of the second operational echelon.[107] The authors note that the forces may operate either in separate zones or in one zone, but in both cases there must be a system for augmenting the VPVOS forces as the PVO SV forces move forward with the troops. The operational group is favorably mentioned as one means of ensuring interaction.[108] The authors do not repeat their criticism of dual subordination nor do they make any normative statements on the desirability of such interaction. Instead the issue is treated as a problem that must be solved. This lack of comment suggests that the initial statement on interaction might have been strong enough and that further negative comments were not necessary. Indeed, even if the PVO SV were to have complete control over forces in the

107 Andersen et al (1979; 192-3). This is initially presented as an observation by West German authors, but from the context and ensuing discussion (which directly refers to the VPVOS in a historical context) it is clear that a surrogate argument is being presented.

108 Andersen et al (1979; 193).

frontal region, there would still have to be an interface with the VPVOS and some problems of interaction would arise.

The PVO SV viewpoint thus differs substantially from that of the VPVOS. This stems largely from their different mission orientations and experiences in the Great Patriotic War. While the VPVOS is primarily concerned with homeland and LOC defense, the PVO SV is much more closely connected to the SV command's viewpoint and shares its concern with defense of troops and operational formations. This difference is clearly reflected in the PVO SV preference for a unified command of all PVO forces in the frontal areas under an SV officer. Similarly, the interpretation of historical events is consistently biased in that it stresses the importance of interaction even at the expense of VPVOS interests such as independence and homeland defense. There is very clear evidence here of a sharp conflict between the VPVOS and PVO SV on the relative importance of troop and homeland air defense and over the nature of their interaction. Overall, the PVO SV position appears to be much closer to the ideas realized in the 1981 reorganization--unification of command and control of PVO forces in the frontal (TVD) areas, merging the PVO SV and VPVOS forces in those areas, and a greater emphasis on PVO responsiveness to SV needs. Indeed, Levchenko's article in *Vestnik PVO* may represent one of the first proposals along these lines and may well have formed the basis for further study leading to the TVD reorganization.

7.7 Summary and Conclusions

The material examined above clearly indicates a divergence of views between the VPVOS and PVO SV concerning a number of historical issues with

direct relevance to modern problems of interaction and organizational structure. These divergences tend to conform to service or branch interests. While there are some changes in these positions over time, for the most part they are relatively constant, suggesting that they reflect basic principles and beliefs.

The primary question throughout this debate was one of centralization and command and control. The need for interaction between the two forces was clearly recognized, but the form of this interaction and who would play the dominant role, was a major point of contention. Let us briefly summarize the positions of the two services on this point.

The VPVOS throughout this period emphasized the priority of centralized control and unification of the IA and AAA branches under one leadership. Yet the emphasis on centralization was tempered by the recognition that sustained, rapid offensive operations posed problems for the control structure that would require some level of decentralization. Whereas a highly centralized defense of fixed targets in the country would be possible, and even desirable, the fluid situation in frontal rear areas as troops moved forward would strain any such centralized system.[109] This point was clearly enunciated in discussions of the rationale for PVO Fronts, the creation of which (particularly in their 1944 guise) was intended to deal with such difficulties. The PVO Fronts (as of Spring 1944) were able to concentrate attention on interaction with the SV Fronts along several strategic directions and accomplish the maneuver of VPVOS forces.

109 This seems to be the point with which Buturlin and Yakimanskiy (1975) disagree. Their article appears to be the only indication that some VPVOS officers believed that intermediate levels of control (probably including Fronts) were rendered unnecessary by advances in command and control technology.

During the later part of the period under discussion, however, VPVOS authors argue that the PVO Fronts' authority was excessively limited and that their ability to move forces was very small. Close interaction with the PVO SV forces was to be dealt with through the formation of operational groups that would coordinate the tactics and control of forces operating in the same area, even though direct control would apparently remain with the separate commanders.

The VPVOS view seems to have been that the Great Patriotic War system of interaction and command and control was quite effective. Some deficiencies, particularly in the areas of coordinated warning systems, difficulties in handing off targets between Air Force and VPVOS IA forces, and in moving forces quickly, are noted but they are not portrayed as critical. Nor is there any indication that there were serious organizational structure deficiencies during the war that would merit major restructuring. In short, the late Great Patriotic War system, with 4 PVO Fronts and the use of Operational Groups seems to have been the preferred VPVOS solution to the problem of interaction.

These views derived from the historical literature tells us a great deal about VPVOS attitudes to the 1981 reorganization. As discussed above, there appears to have been opposition to the creation of TVD level commands with VPVOS forces subordinate to a Ground Forces commander. Furthermore, the subordination of VPVOS forces to the military districts during peacetime and the transfer to approximately 1000 interceptors to the military district Air Forces went directly against VPVOS concepts of resource ownership and control. The post-reorganization structure, particularly the subordination of IA forces, closely resembled that of the

beginning period of the war structure that is strongly condemned in the VPVOS historical literature. Indeed, the stepped up criticism of the IA subordination problem in the years leading up to the reorganization may be an indication of serious opposition to this proposal.

Finally, on the issue of the merger of the PVO SV and VPVOS there is no indication that the VPVOS favored such a move. This may seem contradictory, as the organizational imperative to grow would suggest the opposite attitude. Two possible reasons for this contradiction appear likely: first, that the merger was part of a "package deal" that included elements anathema to the VPVOS, second, that incorporating the PVO SV would complicate command and control, increase the responsibility of the VPVOS, and divert it (and possibly resources) from its primary mission (which was still homeland defense). The addition of the PVO SV, as discussed in the next chapter, does not appear to have been much of an advantage to the VPVOS, as the former seems to have kept much of its own administrative structure and its ties to the SV. In short, there may have been little to gain and a lot to lose by incorporating the PVO SV in the VPVOS structure.

The PVO SV's views on these issues were quite different from those of the VPVOS and reflected the branch's own interests. The bottom line is that the PVO SV would have preferred not to have the VPVOS responsible for the defense of frontal rear areas and LOCs. Instead, the comments of PVO SV authors suggest that a preferable arrangement would be for frontal, and perhaps even TVD level PVO to be provided by PVO SV forces. However, if VPVOS forces are to be operating in the area a command structure where the PVO SV commander has control over them, both operational and maneuver con-

trol, might be acceptable. There seems to be relatively little PVO SV enthusiasm for the operational groups touted by the VPVOS.

Overall, the PVO SV's view of interaction seems to be more closely tied to that of the ground forces: their main concern is protection of troop formations during a rapid offensive. There is less concern about operational independence (not surprisingly for a branch), and more concern about making the PVO forces responsive to Ground Forces requirements. Thus, the PVO SV authors appear to be more amenable to a TVD level control system, particularly if that system provides unified control of both the troops and the frontal rear.

On the question of the merger the PVO SV's position is less clear. Levchenko and other authors endorsed the joint subordination of PVO SV and VPVOS to the Commander of Artillery, and this suggests an interest in closer organizational interaction and possibly incorporation. The comments, however, that the two systems retained their separate staffs and control systems suggests that such a merger should not be too close, and that the two should remain separate systems (with the possible exception of forces in the TVD).

Thus the VPVOS and PVO SV's interests appear to have been represented in the debate over interaction and organizational structure. The VPVOS clearly preferred the existing system of centralized control, or a Front based system that would retain VPVOS independence while giving it a theater role. The PVO SV did not have any independence to lose, and may have stood to gain in terms of resources and control over its area of responsibility, and so seems to have argued in favor of reform of the Soviet PVO structure.

But despite the arguments of the VPVOS to the contrary, the reorganization was enacted. In this case, as in the case with the PRO decision, the advocacy of the VPVOS was insufficient to win the day. The reorganization was proposed in order to enhance control of PVO resources in the theater for conventional warfare, reflecting the strategic concerns of the General Staff and its domination by Ground Forces officers. The General Staff appears to have been willing to trade off some centralized control for greater coordination and interaction between the PVO forces supporting rapid ground offensives. As a bonus, the TVD level command might have provided a more effective defense against ground-launched cruise missiles in Europe.

The fact that the General Staff was able to enact this reorganization despite the objections of the VPVOS gives a fairly clear indication of the relative power of the two levels. But there are also indications that the General Staff was not completely dominant. First, the VPVOS indicated disagreement with the proposed reorganization and some dissent remained after the reorganization. It appears that the General Staff was not able to completely convince the VPVOS leadership of the wisdom of the reorganization or to silence them. Second, the very long time between the initial Kulikov article (and the even earlier studies of strategic leadership) and the formation of TVDs raises the possibility that the VPVOS opposition slowed the implementation of the proposals. Indeed, the formation of the first TVD command (in the Far East) appears to have been undertaken without a reorganization of VPVOS and Air Force forces in the area. Thus, it is possible that VPVOS advocacy had some influence in the decisionmaking process. This case therefore provides some bounds on the

influence of the VPVOS: it is clearly weaker than that of the General Staff but it is able to advocate its positions and participate in the decisionmaking process. This supposition is strengthened by the subsequent decision to reverse the reorganization in the mid-1980s, the topic examined in the next chapter.

CHAPTER 8

THE VPVO AFTER THE REORGANIZATION

8.1 Introduction

In the previous chapter VPVO viewpoints and its opposition to the reorganization were investigated. After the reorganization these views, and even the opposition, do not appear to have significantly changed. Indeed, throughout the period from 1981 to 1986 there are various indications of VPVO opposition to the new organizational structure. This criticism of the new organization intensifies after the KAL 007 shootdown and culminates in the 1986 reversal of the reorganization.

Throughout this period the VPVO maintained an opposition to the reorganization that kept the issue from completely disappearing from the agenda. The identity of the two forces (formerly VPVOS and PVO SV) remained quite separate despite their new formal unity and their perspectives on the reorganization continued to differ. The KAL 007 shootdown revealed shortcomings in the new command and control structure that again raised the prominence of the issue on the agenda and gave the VPVO a concrete example for its arguments. Furthermore, the changes in the top political and military leadership in 1984 may have created a good opportunity to press its case and reverse the original decision. The evolution of VPVO positions on the reorganization and their consequences for the decision to reverse the reorganization are examined below.

8.2 VPVO Reactions to the 1981 Reorganization

The 1981 reorganization was heralded by two articles reinterpreting the history of the VPVOS and PVO SV in a quite striking and blatant manner. These articles are clear examples of the use of history to make arguments concerning the present and they run counter to all the previous articles in the VPVOS press.[1]

The most elaborate presentation of the pro-reorganization viewpoint is found in an article published in the November 1980 issue of *Voyenno-istoricheskiy zhurnal* by Colonel Gorbunov.[2] This article may be viewed as a justification of the merger of the PVO SV and VPVOS. For the first time, Gorbunov merges the historical literature of the PVO SV and VPVOS, providing an overview of the development of PVO forces during the Great Patriotic War. Gorbunov also claims that the main tendency in the development of the PVO system was to "create a system of PVO that can provide both an effective defense of troops on the battlefield and of objectives in the rear of the country."[3] Thus Gorbunov goes much further than any previous author in suggesting the merging of the air defense forces.

While Gorbunov does point out some deficiencies in the pre-war PVO organization he is not very critical and he is also lukewarm towards the

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1 It is noteworthy that they appeared in *Voyenno-istoricheskiy zhurnal*, rather than *Vestnik PVO*, probably in order to reach the widest possible audience of officers rather than just the VPVO officers. No similar articles were published in *Vestnik PVO*, perhaps indicating an unwillingness to endorse the changes.

2 Gorbunov's position is not known, but he did coauthor an earlier article with Yakimanskiy in 1973, suggesting a possible affiliation with the VPVOS Command Academy.

3 Gorbunov (1980; 23).

November 1941 reorganization, pointing out that the transfer of AAA from the PVO SV to the VPVOS was detrimental to troop PVO.[4]

The most unusual aspect of Gorbunov's article is his discussion of the separation of the PVO SV and VPVOS. While most VPVOS authors regard the separation as beneficial, Gorbunov points out a number of deficiencies, noting that in offensives in Fall 1942 and Spring 1943 PVO SV didn't have sufficient forces and a gap of up to 300 km arose between the PVO SV and VPVOS. The weak defense of Gor'kiy also stemmed from the lack of coordination between the two forces. From this, Gorbunov argues that integration was required, allowing more rational use of forces. Echoing the arguments of Klevtsov and Levchenko, Gorbunov argues that this prevented the "freezing" of PVO forces around objects out of range of the enemy, allowed VPVOS units to move to the front, and facilitated wide maneuver of the forces.[5] Overall, Gorbunov argues that the joint command of the two forces allowed formation of a closely coordinated, multi-echelon air defense.

Gorbunov notes the importance of the formation of PVO Fronts and argues that centralization of control at the operational-strategic level by the formation of PVO Fronts and armies (*ob'yedineniy*) was an important element in the development of the PVO.[6] Indeed, Gorbunov points out that the PVO Fronts are an example of the "forward character" of Soviet military science.[7] This discussion of PVO Fronts may be a surrogate argument

4 Gorbunov (1980; 25).

5 Gorbunov (1980; 25-26).

6 Gorbunov (1980; 26-28).

7 Gorbunov (1980; 28). Note that Svetlishin (1976; 45) also uses this formulation.

for the TVD level command, for unlike other VPVO authors he couples the argument for centralization at the operational-strategic level with a call for unified (e.g. PVO SV and VPVOS) PVO forces.

In closing, Gorbunov notes that successful air defense requires a PVO system in which PVO SV and VPVOS are component parts, centralized leadership of all forces and means of PVO, and an organizational structure that is in accord with the nature of armed combat.[8]

Gorbunov thus argues that the purpose of the reorganization is to create a more flexible and responsive PVO system that can maneuver and control troops in the TVD. By merging the two forces the problems of dual subordination and freezing of VPVOS troops in the rear can be avoided, providing a stronger and more coherent PVO to support conventional offensives in the TVD.

While Gorbunov's article was a dramatic reinterpretation of VPVOS historiography, it was not the only indication of a change in the VPVO. In case readers missed the import of Gorbunov's article another clear indicator of change was published in the April 1981 issue of *Voyenno-istoricheskiy zhurnal*. This article, by Colonel Frantsev, is noteworthy for its extreme brevity--it is only two pages long.[9] Most of the article is a recitation of well-known facts about the quantitative growth of the VPVOS during the Great Patriotic War. The outstanding part of the article and probably its *raison d'etre*, is one paragraph in which Frantsev notes that "regrettably the central organs of unified[10] leadership of all troops

8 Gorbunov (1980; 29).

9 Most *Voyenno-istoricheskiy zhurnal* articles are five to 10 pages long. A two page article is almost unheard of.

10 The word used here is *ob'yedineniy*.

of the PVO were not developed further during the course of the war."[11] Frantsev thereby turns the once deplored merging of the PVO SV and VPVOS under the leadership of the Commander of Artillery into one of the most important and favorable events in VPVOS development, a very blatant example of the reinterpretation of history to fit the present.[12] This article may have been intended as a signal of the importance of the reorganization and or even an indication it had been completed.

While the articles by Gorbunov and Frantsev might have been expected to usher in a new era in VPVO historiography, they did not. The articles published by VPVO historians and high-ranking officers after the reorganization are primarily notable for their resemblance to those published before the reorganization.[13] First, the integration of PVO SV and VPVOS history presented by Gorbunov and Frantsev is not repeated.[14] Second, the argument that the subordination to Artillery was a positive development is not repeated. Indeed, there is a noteworthy silence on this topic.[15] Most VPVO (and all former VPVOS) authors completely ignore the Gorbunov and Frantsev viewpoint.

If the Gorbunov and Frantsev articles were not intended as a "new line" in VPVOS history why were they written? These articles were sur-

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11 Frantsev (1981; 47).

12 It is interesting to note that neither Gorbunov nor Frantsev seem to have published on VPVO topics since, and that these relative unknowns were chosen for these statements rather than more prominent VPVO historians or other VPVO officers. It suggests that these articles are meant less as serious work than as justifications for decisions already made.

13 See, for example, Romanov (1982), Smirnov (1983).

14 With the interesting exception of Mal'tsev (1986) which is the post-mortem on the reorganization.

15 See Table 2 in Chapter 7.

rogate discussions and justifications of the 1981 reorganization and they may have been commissioned by the General Staff in order to explain the reorganization to officers both within and without the VPVO. The fact that these arguments were not endorsed or repeated in the VPVO literature strongly implies VPVO disagreement with the reorganization, and the fact that implicit criticisms of many of the points made by Gorbunov are repeated in the VPVO historical literature after 1981 is an even stronger indication of VPVO discontent. Furthermore, the existence of two quite different bodies of historical literature within the VPVO (PVO SV and VPVOS) indicates that both forces retained their own viewpoints and were not very integrated.

VPVO dissatisfaction with the new arrangement slowly emerged in new themes in the VPVO literature after the Gorbunov and Frantsev announcements of the reorganization. VPVO discussions appear to have gone through two phases. First there was a general "passive resistance" and muted criticism in 1981-83.[16] Second, in 1984 criticisms of the VPVO structure become more direct and frequent and new themes rise to prominence, such as the creation of a combat ready PVO system before the start of the war.

8.2.1 Early Reactions to the Reorganization

While Gorbunov had referred to the importance of centralized control, Koldunov came up with a new phrase to describe the optimal control structure: "single" control of unified forces. The phrase "single" con-

16 The Russian word used is *yediniy* which I translate here as "single" as this seems more appropriate than "unified." Both senses of the word may apply, as the VPVO argument appears to be for both centralized control of several "unified" branches under a "single" leadership.

trol appears to be an argument in favor of control of all VPVO forces by one leader, rather than a system of dispersed control such as the TVD commands.[17] This is distinct from Gorbunov's call for a unified PVO system incorporating both VPVOS and PVO SV forces.[18]

The importance of single command and control was stressed in Koldunov's first *Voyenno-istoricheskiy zhurnal* article, recounting the air defense of Moscow. While the rest of Koldunov's article is unremarkable, towards the end he draws the conclusion that:

> Experience showed that only a single control of all PVO forces, in the first order Fighter Aviation and AAA, (and later Surface-to-Air Missile Troops), provides for their coordinated activities. And this appears an important condition for the effective use of the VPVO in combat with the air opponent.[19]

This explicit reference to a modern VPVO branch in the context of a historical essay is highly unusual and indicates that Koldunov intended his comment to be applied to the present. Having made this argument Koldunov goes on to place great stress on the importance of learning from history, particularly so that past deficiencies will not be repeated.[20] While Koldunov does not specify what deficiencies it appears he is referring to referring to the need for centralized, single control rather than the more decentralized command structure of the beginning period of the war.

Similar comments on the need for "single control" appear in several of Koldunov's articles and editorials, as well as in the works of other

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17 Koldunov distinguishes between unified (*ob'yedineniy*) forces and single control in his discussion, suggesting that he is stressing single control in the sense of *yedinonachaliye* or one-man leadership.

18 Gorbunov (1980; 24, 27, 29).

19 Koldunov (1981; 51).

20 Koldunov (1981; 52).

VPVO authors.[21] The appearance of this new phrase indicates some discontent with the creation of a less centralized command and control system for the VPVO. This theme becomes even clearer after 1983, when the debate over organizational structure again becomes more explicit.

Another indication of dissatisfaction with the reorganization was indicated in an article by Colonel General of Aviation N. Dagayev which examines the problem of establishing PVO of liberated territory.[22] Dagayev's article is fairly routine, but in an unusual comment he states that the successful defense of liberated territory was possible only because of the operational subordination of fighter aviation units and divisions to the VPVOS. This conclusion seems to be pulled out of the air, and coming so soon after the transfer of IA assets to the military districts, it suggests a surrogate argument against the transfer. This view is reinforced by Dagayev's comment almost immediately afterwards that the experience of the war can help solve contemporary theoretical problems.[23]

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21 Koldunov mentioned the issue again in a *Vestnik PVO* editorial in April 1982, observing that its importance for coordination of IA and AAA was demonstrated in the Great Patriotic War. Koldunov points out that such a system of control provided for high effectiveness in all periods of the Great Patriotic War. See Koldunov (1982; 4), Koldunov (1984; 17), Koldunov (1985a; 61), Koldunov (1985b; 5), Slezkin (1985; 87). It is not, however mentioned in some other, largely historical articles by other VPVO officers such as Romanov (1982) and Smirnov (1983).

22 Dagayev (1981). Dagayev apparently used to be in the VPVOS in the early 1960s, as he signs a number of VPVOS obituaries, but in 1962 he became Chief of the Main Directorate for Military Assistance of the General Staff, and in 1975 became a Military Consultant to the Main Inspectorate (CIA (1983; 4)). Thus, Dagayev's tie to the VPVO is rather distant and it is surprising to find him writing on this topic. Given his position at the Main Directorate it is very likely that he was deeply involved in establishing the PVO systems of Vietnam and Egypt.

23 Dagayev (1981; 35).

While most VPVO articles either ignored the reorganization or subjected it to veiled criticism, a more moderate stance also seems to have appeared briefly. This view was that the organizational structure of the beginning period of the war had not been given time to prove itself and to have all the problems worked out in exercises before the start of the war.[24] While this viewpoint was only expressed in two articles in 1983 and 1984 it indicates a possible growing acceptance of the reorganization. After these articles, however, criticism of the reorganization increases, suggesting that the authors may have lost a debate over whether the reorganization had been successful or not. Since both authors were from the Zhukov Academy it is possible that this view was accepted to some extent at the Academy.[25]

During the early years after the reorganization, VPVO dissatisfaction was registered more by silence than by active criticism. Nonetheless, this "passive resistance" seems to be fairly clearly directed against the main features of the reorganization. In later years, however, VPVO objections appear to have greatly increased and become more open and explicit.

8.3 External Factors: The Lebanon Air War and KAL 007

During the early 1980s the VPVO leaders may also have been distracted by events beyond their control: the Lebanon air war and the KAL

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24 Slezkin (1983; 89), Boshnyak (1984; 45).

25 Boshnyak was head of the Zhukov Academy from approximately 1982 to mid-1985. It is possible that his removal from the academy position after a relatively short tenure was prompted by his partial endorsement of the reorganization. Slezkin was a *Kafedra* head at the Zhukov Academy, and appears to have retired sometime in the mid-1980s. A later article co-authored by Slezkin does not refer to his old views on the beginning period of the war organization.

007 shootdown. But while not directly connected to the issue of reorganization these events may have had an impact on the course of the debate.

The Lebanon air war raised serious questions about VPVO capabilities: the weapons destroyed in the Israeli attack were all front-line VPVO equipment, primarily SAM-6 missile batteries and MiG-23 fighters. That the successful Israeli action provoked concern amongst the VPVO leadership is quite clear: only 4 days later a delegation headed by Col. Gen. Yurasov was sent to Syria to investigate the situation.[26] Furthermore, the Soviet media went to unusual lengths to reaffirm the value of Soviet arms and implicitly lay the blame on the Syrians themselves.[27]

Despite the attention given to the Lebanon war, there were no major repercussions in the top VPVO leadership: no top officers in the branches or Main Staff lost their jobs. At least one lesson was learned from the war, and that was the importance of dogfighting. Vietnam and the 1973 war had indicated the essential importance of this skill for fighter pilots, but the VPVO made only minor changes along these lines.[28] The Lebanon air war was a critical reminder of the consequences of neglecting realistic air combat training and the overemphasis on ground-controlled intercept tactics, and during 1983 a large number of articles on this topic appeared

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26 Lambeth (1984; 2, 13). Marshal Ogarkov, Chief of the General Staff is also reported to have visited Syria, another very significant indication of high-level military concern. See Lambeth (1984; 13).

27 Lambeth (1984; 13-17).

28 See Chapter 6, and Lambeth's discussion of similar Soviet Air Force tactics. The very strict control of the ground-controlled intercept operator over the pilot's actions has also been commented on in the KAL case, where an actual transcript is publicly available. See Hersh (1986; 227-229, 232-234). The transcript is reprinted in Dallin (1985; 22-25).

in *Vestnik PVO*.[29] Whether these articles brought about a real change in IA performance and skills is uncertain, for complaints about a lack of pilot initiative and skill continued to appear for several years afterwards.[30] Once again, the lessons may have been clear but the incentive structure combined with old habits inhibited any rapid change in training or performance. This is particularly so since there was no turnover in leadership, so the same old officers were entrusted with developing and overseeing the new training plan.

While the Lebanon air war certainly did not enhance the VPVO's prestige, it did not result in harsh penalties as the VPVO apparently deflected much of the blame onto the Syrians.[31] This setback may, however, be a contributing factor to the decrease in articles on organiza-

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29 A new campaign to improve Soviet fighter performance was kicked off in the March 1983 *Vestnik PVO*, with an article by the Deputy Commander of Aviation Lieutenant General Tsibizov. Tsibizov points out that the enemy will attempt to use electronic countermeasures (ECM) to disrupt the work of pilots, command posts and particularly ground-controlled intercept operators. a clear allusion to the Lebanon air war. He then goes on to stress the need to develop air combat skills, noting that they were proven necessary in local wars in the Mid East (read Lebanon) and the Falklands. See Tsibizov (1983; 16). Some of the other articles in this campaign are Omel'chenko (1983), Mikhaylovskiy (1983), Khatylev (1983). For a detailed examination of the response of the Soviet Air Force in one article see Lambeth (1984). Lambeth's report also includes the best available summary of Israeli actions against the Syrian PVO and a very informed and interesting examination of the lessons learned and mislearned by the Soviet Air Force. Lambeth's general conclusions are similar to those suggested here and in Chapter 4: the services tend to interpret the combat experience through their own cognitive preconceptions, learning lessons that are the most compatible with current tactics and weapons, while misinterpreting or ignoring evidence that runs counter to their preconceptions.

30 See Rusanov (1987), as well as Kudinov (1986) and Gorbatyuk (1986).

31 After all, they could point to the relative success of the Egyptians in 1973, or at least the Egyptian SAM forces. Furthermore, they could plead the uniqueness of the Mid East case, a case that is not likely to be repeated in Europe. This point is elaborated upon by Lambeth (1984; 10-11).

tional structure noted in 1983: the Lebanon experience wouldn't enhance the argument for de-reorganization, and the VPVO leadership might not have been in a position to press its views.

After the Lebanon air war things didn't quiet down for the VPVO: U.S. overflights of the Kurile Islands in April 1983 caused VPVO forces in the Far East to be placed on a high alert level for most of the spring and summer.[32] In September 1983, however, the problems with the command and control system appear to have been shown up clearly.

Unlike the 1978 KAL incident, the story of KAL 007 is well known and need not be recounted here. What concerns us are the implications for the VPVO and its command and control system, areas that have not been examined in much detail. Fortunately, Hersh's book on the KAL incident provides a fairly detailed and presumably accurate account of the working of the Soviet control system during the incident.[33]

According to Hersh's description the chain of command for the final intercept and shootdown went from the Sakhalin base tracking the aircraft up to the military district headquarters (and the Deputy Commander of the military district for PVO) at Khabarovsk.[34] From there we might expect the chain to connect directly to the TVD command in Chita.[35] However, the

32 Spring 1983 also saw the announcement of SDI, another topic of interest to the VPVO. Hersh (1986; 16-19).

33 Hersh (1986). Hersh's book is largely based on interviews with members of the intelligence community and presents the most detailed picture available of Soviet reactions to the KAL flight. While there may be parts of the story missing if Hersh's interviewees tried to protect sensitive information the general outline of Soviet actions seems plausible.

34 Hersh (1986; 224).

35 Some articles and newspaper accounts suggest this, but do not give any evidence. See Green and Rivkin (1984; S10671), Owen (1983; 1). The latter source has major errors in other respects and may be wrong in this as well. I am indebted to Peter Almquist for bringing these sources to my attention.

Deputy Commander for PVO went directly to the VPVO main command post in order to get instructions and authorization to fire.[36] Apparently after the reorganization the Khabarovsk PVO center did not have direct secure communications to the Moscow command post, nor could it directly transfer radar tracks.[37] After receiving a message from Moscow (evidently a process taking several minutes) the order was given not to fire unless visual identification of the target was accomplished first. As Hersh points out, the local VPVO commander on Sakhalin violated these rules of engagement and ordered the aircraft shot down.[38]

This sequence of events provides some insight into the VPVO command and control system. First, if Hersh is correct, the next higher level of command was the Moscow command post, not the TVD command. This is consistent with the TVD command being in a "dormant" state during peacetime, waiting to take control during wartime but not in the everyday loop. Second, it suggests that the Military District Deputy for PVO was either un-

36 Hersh (1984; 230-31).

37 Hersh (1984; 230-32). The actual communication link had to be made from a separate building used by the Air Force. The comment on radar data is a surmise from Hersh's account--there is no indication that digital data transfer of radar tracks or other essential information was transferred to the Moscow command post. The main link appears to have been a scrambled voice circuit. This suggests that despite the constant discussion of the importance of automated systems of control to the centralized control of VPVO forces that the system may not be completely automated. This conclusion is surprising given that the U.S. SAGE system completed in the early 1960s had most of these capabilities using relatively primitive computer technology. Further evidence for this may be found in Belenko's (1988; 95-98) comments on the primitive state of the VPVO system. There is also abundant Soviet material indicating that radar tracks are still manually plotted and that Morse code is used for communications.

38 Hersh (1986; 232-34).

able or unwilling to make the decision to fire himself. Given the tendency to "pass the ruble" upwards in the Soviet system it seems highly likely that even if the Deputy had the authority to make the decision he would have tried to shift the responsibility upwards to the higher command levels.[39] It seems unlikely that the Deputy for PVO was unable to make the decision since the point of the reorganization was to give the military districts that type of decisionmaking power. Thus it appears likely that the Deputy for PVO was trying to get formal approval for his actions from the top leadership. Third, the length of time required to establish the communications lines seems to have been very long, perhaps a matter of up to tens of minutes, a significant problem in a time-urgent situation. Fourth, it appears that the aircraft had been observed but not intercepted over Kamchatka and that warnings may not have been passed to higher command levels (such as the military district in Khabarovsk).[40] If they were, the upper command levels do not appear to have taken any special steps before the aircraft came within radar range of Sakhalin.[41] Thus, there is evidence of local cover-ups of crucial information that severely hampered central control.

Overall, the VPVO turned in a mediocre performance. Certainly there were deficiencies in the combat readiness and performance of some units at the local level. On the other hand the intercept was finally made. But more importantly, the VPVO that had always been arguing about the need to prepare for surprise attack found itself reacting fairly slow-

39 See the discussion of this topic in Chapter 2.

40 Hersh (1986; 218-9).

41 Hersh (1984; 223).

ly to a real surprise. The system did work, but it was cumbersome and sluggish.

From the data provided by Hersh it appears that the VPVO command and control system had a number of problems. The Khabarovsk military district control center was ill-equipped and unprepared to communicate with Moscow and perhaps even with Chita and the overall reaction time was quite long, indicating that even if the command and control system were not flawed it was not very efficient. These problems may well have provided arguments for those who were already critical of the TVD command system.[42]

VPVO reaction to the incident was swift and harsh. In a November *Vestnik PVO* editorial the KAL 007 flight was denounced as a "criminal diversion organized by U.S. special services in the Far East."[43] But the editorial was no less harsh on the performance of the VPVO command and control system, and particularly on the performance of some commanders. Indeed, the editorial was titled "Heighten the Operativeness of Combat Control" and it called for rapid, flexible control at all levels. Decisiveness and swiftness of reaction were stressed and officers who spend too much time dithering without solving problems were harshly criticized. The importance of quick reaction, even at the expense of considering all possible actions, is stressed and pedantry and formalism are at-

42 It is curious that the TVD level was not involved in the decisionmaking process. It may just be that Hersh was unable to gather information on their role. Even if the TVD command in Chita had been involved, it is unlikely that it would have decreased the VPVO response time. Instead the addition of one more command level might have slowed the process even further, as it undoubtedly would have been referred up to Moscow for final decision and additional transfer time would have been required.

43 "Povyshat' operativnost' boyevogo upravleniya" (1983a; 3).

tacked.[44] A new theme also appears, spurred by revelations of U.S. eavesdropping: the need for greater emphasis on communications security.[45] In sum, the reaction was primarily to blame the commanders, but the stress on the importance of flexible command and control indicates that problems in the system were suspected and the command structure was undoubtedly subjected to scrutiny. Thus the VPVO clearly stressed the importance of the command and control system and implied that it had not performed well.

But while there were denunciations and even demotions of lower-level commanders there were some major differences from the 1978 KAL incident.[46] First, there were no top-level leadership changes, indicating a general satisfaction with the VPVO performance.[47] Indeed, within 18 months Koldunov had been promoted to the highest military rank, Chief Marshal of Aviation.[48] Furthermore, the Commander of the Far East TVD, Govorov, was promoted and moved to Moscow as Chief of the Main Inspectorate, becoming a Deputy Minister of Defense as well, and he later moved on to head Civil

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44 "Povyshat' operativnost' boyevogo upravleniya," (1983a; 3-6).

45 "Povyshat' operativnost' boyevogo upravleniya," (1983a; 5). The best example of this new stress is an article by Major General Reshetov the Chief of Communications Troops of the Moscow military district. Among other things Reshetov states that Morse code is still used and implies that all means of communication (including telephone land-lines) must be assumed to be tapped. See Reshetov (1984).

46 Hersh (1986; 236-37) reports that "two senior officers on duty at Sakhalin were relieved of command and presumably demoted." However the deputy commander for air defense at Khabarovsk was promoted, according to Hersh for insisting on visual identification before firing. Hersh also claims, without being specific, that the VPVO force at Sakhalin was restructured and rules of engagement were revised.

47 Hersh notes that the Deputy Commander of the military district for PVO was promoted after the shootdown, but that some lower-level officers were cashiered. Hersh (1986; 236-7).

48 See Koldunov (1985) for the new rank listing.

Defense.[49] Clearly there was no guilt or blame attached to the higher command levels, and their performance even seems to have been rewarded.

In the wake of the KAL incident the VPVO undertook a campaign to correct some of its revealed deficiencies. An article in *Vestnik PVO* by the Commander of the Radiotechnical Troops stressed the need for radar units to pass on all contacts to higher command posts as rapidly as possible.[50] Koldunov addressed the KAL incident (which he describes as the penetration of Soviet borders by an "American military aircraft") by calling for realistic, objective appraisal of combat readiness, and the need to avoid overestimating the abilities of one's troops.[51] Thus, once again the stress returns to maintaining high levels of combat readiness.[52]

Finally, after the criticisms of combat readiness and RTV performance the lawyers got their turn. In a very direct article discussing the Law on Combat Alert, the First Deputy Chief of the Military Procuracy, General Major B. Popov, outlined the strict criminal punishments for those found negligent while on combat alert. The law on combat alert, and the penalties for breaking it "with heavy consequences" were changed in December 1983, increasing the terms substantially, to from 3 to 10 years imprisonment. As an example of "heavy consequences" Popov happens to choose

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49 Warner, Bonan and Packman (1987; 36). Govorov was replaced at the TVD command by his former subordinate and Commander of the Far East Military District, General I. M. Tret'yak. Tret'yak later went on to become Chief Inspector, then in the wake of the Rust affair became the Commander in Chief of the VPVO. See Warner, Bonan and Packman (1987; 51).

50 Dobrovol'skiy (1983; 9-11).

51 Koldunov (1984a; 6-7).

52 See also Mal'tsev (1984). Mal'tsev became the new Chief of Staff after Romanov died in a plane crash May 1984. See *Krasnaya zvezda* May 5, 1984 p. 4.

(amongst others) penetration of Soviet airspace by a foreign military aircraft.[53] To make the point clear Popov cites the case of a junior sergeant who was drinking when he was responsible for guarding Soviet airspace, noting that he will be tried under the law.[54] Other officers are also criticized for not monitoring their troops properly and allowing drunkenness and absences from combat posts during combat alert.[55] Popov's article is clearly not a coincidence and it suggests that Western stories of drunken pilots and inefficiency on the part of the VPVO might have been rather close to the mark.

Overall the VPVO reaction demonstrated more open criticism than in 1978 but there were fewer ramifications for the top leadership. The VPVO did manage to fulfill its mission, and despite the public embarrassment of destroying a civilian airliner, the private embarrassment appears to have been much less. From the VPVO point of view shooting down the aircraft was probably a better result than letting it pass unintercepted or damaging the aircraft and having it fly around Soviet territory undetected, as had happened in 1978. At least in this case they had intercepted and destroyed the target and with it the evidence, thereby proving the capabilities of the VPVO to those who didn't examine the details too closely. But from a VPVO perspective the KAL 007 incident had revealed a rather sluggish command and control system that allowed a foreign aircraft to penetrate Soviet airspace and almost escape. Despite the criticism of low

53 Popov (1984; 9-10).
54 Popov (1984; 9).
55 Popov (1984; 10-11).

level commanders this incident seems to have spurred renewed concern over the command and control system.

8.4 The Debate Rejoined: 1984-86

The debate over organizational structure intensified in 1984, with several articles directly related to this topic appearing in both *Voyenno-istoricheskiy zhurnal* and *Vestnik PVO*. It likely that this new debate was triggered by the KAL incident. Of particular interest is the emergence of the theme of "timely creation" of the PVO system, a suggestion that command and control VPVO forces be under the same leadership under both peacetime and wartime because of their need to react rapidly to a surprise attack.

Critical high-level discussion of the VPVO reorganization reappears in 1984 with a *Voyenno-istoricheskiy zhurnal* article by Marshal Koldunov on the organization and conduct of PVO in the beginning period of the Great Patriotic War. Koldunov focuses on a period where the organization of the VPVOS was similar to the present and presents an attack on the beginning period of war system that resembles the new organization structure.

Koldunov outlines the zone (military district) based pre-war structure, noting that the Main Staff of the Chief PVO Directorate (GU PVO) had no operational control, and that operational control was given to the General Staff.[56] This statement is highly unusual. Most accounts state that operational control was vested in the military district or Front commanders at the beginning of the war and it was not until a few months into

56 Koldunov (1984; 12-13).

the war that the leading role of the General Staff became apparent. Koldunov's statement appears to be more relevant to the present when General Staff control would be exercised through the TVD level. The statement may also be a flag that a surrogate discussion of contemporary topics is to follow.

After describing the PVO organization at the beginning of the war, Koldunov turns to a critical discussion of the PVO's performance. Koldunov notes the need for the timely creation of the PVO with necessary forces and states that the beginning period of the war demonstrated that the defense of important centers and regions could not be left to fragmented PVO forces subordinated to various levels of command. The language used in denouncing the fragmentation is unusually direct and harsh and Koldunov strongly argues the need for single control of all PVO forces, specifically including IA, as a necessary condition for successful defense.[57] Koldunov's arguments are more vociferous and direct than those of many other VPVO authors and they are presented in a context that conveys their relevance to present conditions and concerns.

Koldunov also stresses the importance of combat readiness, apparently referring in part to the need to establish the wartime command structure in peacetime. Koldunov stresses the danger of surprise attack throughout the depth of the country, citing local wars as well as the Great Patriotic War for support.[58] This appears to be an allusion to the danger of conventional air attacks throughout the theater and into the

57 Koldunov (1984; 17). In this case Koldunov criticizes the shortages of AAA in a manner reminiscent of the PVO SV articles.
58 Koldunov (1984; 19).

Soviet Union itself. This would further imply the need for a single control of both border and homeland areas.

Koldúnov argues that the enemy air force is the main strike force for resolving operational and strategic tasks in the beginning period of the war and that a strong PVO is therefore the decisive condition for preserving the military-economic potential of the country and the combat ability of the armed forces.[59] Thus the VPVO could be decisive in the beginning period of the war, and perhaps in the war as a whole. In a manner reminiscent of the early 1960s Koldunov claims a very great strategic importance for the VPVO in counteracting the surprise attack threat. As if to make the point unmistakable, Koldunov repeats it twice in his conclusion, adding the argument that the role of surprise is growing.[60]

The argument that a surprise air attack is likely to start any war strongly suggests that VPVO forces must have a peacetime command and control system that is on a war footing. In case of a surprise air attack there would be no time to reorganize the command and control system and re-route command lines through the TVD. Thus Koldunov's argument for a combat ready, timely created PVO presents itself as a criticism of the peacetime/wartime split in the command structure and the rest of the article argues for a more unified system that would exercise direct control over forces in both peacetime and wartime, eliminating the transition problem. Indeed, Koldunov reiterates his call for a the unification of PVO forces under a single operational and tactical control system.[61]

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59 Koldunov (1984; 19).
60 Koldunov (1984; 18-19).
61 Koldunov (1984; 19).

While many of the arguments raised by Koldunov are similar to those presented before the reorganization, their presentation, combined with the recommendations, strongly suggests great concern over the loss of operational control in the border regions. Koldunov appears to have used the discussion of the beginning period of the war as a surrogate argument in favor of returning Fighter Aviation to VPVOS control and creating a single unified command system for the entire country and theater.

Early 1984 also saw the publication of two other articles that expressed dissatisfaction with the organizational structure, albeit from different viewpoints. On the VPVOS side, the problem of overly centralized General Staff control was again raised. This issue had been first brought up by Svetlishin in 1979, and then remained dormant during the first years of the reorganization. Slezkin and Mosevkin, in a *Vestnik PVO* article raised this point as one of the critical factors hindering the effective control and maneuver of VPVOS forces during the Great Patriotic War.[62] They also note that the PVO Front commanders were limited to a small reserve force (a *podrazdeleniy*--an AAA battery or an armored train) that is clearly far too small for such a large operational unit.[63] But, as noted in Chapter 7, the author's solution to this problem is to endorse the creation of operational groups, even though such groups also would not have the authority to move forces. In closing the authors note that close interaction of PVO forces in the prifrontal regions is necessary and that

62 Slezkin and Mosevkin (1984; 84). See Chapter 7 for their account of the difficulties of transferring a searchlight company from one position to another.

63 Slezkin and Mosevkin (1984; 84).

it was organized according to Supreme High Command (VGK) orders that created the basis for a single PVO system in the TVD.[64] Given their earlier criticisms the authors seem to be arguing for greater authority for the PVO commanders, possibly to be vested in operational groups to facilitate interaction of PVO SV and VPVOS forces.

But while the VPVO authors were criticizing the tight General Staff control, a PVO SV representative made a suggestion of quite a different kind. Writing in *Vestnik PVO* a month after Slezkin and Mosevkin, General Major Sherstyuk argued strongly against any VPVOS role in the prifrontal regions.[65] After describing the methods and problems of PVO SV and VPVOS interaction during the Great Patriotic War, Sherstyuk cites Voronov to the effect that:

> Effective PVO of troops of the front, army and frontal rear objectives, communications, is possible only when all of the *soyedineniy* and units of the PVO in the field of the front up to its rear borders is completely subordinate to the military soviet of the [SV] front. *Soyedineniy* of the VPVOS must protect from attack objectives beyond the rear borders of the front.[66]

This conclusion is remarkably direct and blunt: the VPVOS should not have any role in the frontal rear areas but should be confined to defending behind these areas. In essence, this argument means that the VPVOS should not pursue the LOC defense missions close to the front that were a large part of its work during the Great Patriotic War. If it does, however, those forces should be fully subordinate to the SV Front. This

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64 Slezkin and Mosevkin (1984; 85).

65 Sherstyuk appears to be a PVO SV officer, probably a professor at the Vassilevskiy Academy. This surmise is based on his lack of previous publication in *Vestnik PVO* and a more recent article reflecting a PVO SV bias.

66 Sherstyuk (1984; 91).

argument is very similar to that made by Andersen in 1979, and clearly reflects a PVO SV preference for keeping VPVOS forces out of areas where dual subordination could become a problem.[67] This argument could be extended from the Front level to the TVD level, suggesting that Sherstyuk is endorsing the centralized command of all forces under the TVD command.

Thus by early 1984 a new debate proper PVO organization had emerged. The positions closely resemble those of 1979: the VPVOS arguing for a single centralized control system, with the PVO SV arguing for a more decentralized system with all PVO forces subordinate to the SV Front (or TVD).

Many of these issues also appear in the following year, just before the de-reorganization, albeit in a less direct form. In a 1985 *Voyenno-istoricheskiy zhurnal* article Koldunov stresses the importance of single centralized control on a nationwide scale, while ignoring the subordination to Artillery.[68] Koldunov also notes the important contributions of PVO Fronts, particularly their easing of interaction with PVO SV forces in the TVD.[69] But the PVO Fronts are not presented as great breakthroughs in Soviet military science, and instead the stress is laid on the 1941 reorganization and the importance of unified and centralized control.[70] While this article does not feature the fairly direct arguments of his previous article it reiterates many of its main points and concerns.

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67 See the discussion in Chapter 7. Note that Andersen et al (1979) also resorted to a prominent military figure for the argument, rather than proposing it themselves.

68 Koldunov (1985a; 58, 61). Single centralized control is also endorsed in Koldunov (1985b; 5).

69 Koldunov (1985a; 62).

70 Koldunov (1985a; 61-62).

By the time this last article appeared in *Voyenno-istoricheskiy zhurnal* the decision to undo the 1981 reorganization had probably already been made, as the de-reorganization appears to have taken effect at the beginning of 1986 and the planning for it would have taken several months to a year. It therefore appears that the early 1984 cluster of articles represented an important step in the debate over organizational structure and the final decision on the issue may have taken place in mid to late 1984.

Throughout the period surveyed there is evidence of VPVO concern over centralized, unified, command and control of VPVO forces with an implicit criticism of the military district and TVD organizational structure adopted in 1981. This concern was reflected in Koldunov's stress on unity, the failure to endorse the subordination to the Commander of Artillery, the criticisms of the beginning period of the war organizational structure, and objections to overly strict centralization by the General Staff. All of these points indicate a strong preference for the creation of a PVO system under centralized control with a command and control system that would be able to transition rapidly and smoothly from a peacetime to wartime state.

These arguments come to the fore in 1984 and 1985 after the KAL incident, and the VPVO and PVO SV viewpoints are articulated in a renewed debate. This debate coincides with the advocacy and decisionmaking stage of the decisionmaking process, and suggests that the VPVO had found a new opportunity to press its case. In the section below the course of the reversal of the decision and its consequences are examined.

8.5 The Reorganization of 1985-86

Beginning in early 1986 there are indications of a major change in the VPVO organizational structure. Articles from former PVO SV schools disappear from the pages of *Vestnik PVO*, as do the articles about, and photos of, PVO SV forces. In *Krasnaya zvezda* troop designations change and VPVO forces are not attributed to Military Districts.[71] Finally, the former First Deputy Commander VPVO for PVO SV forces, Colonel General Chesnokov appeared in *Voyennyy vestnik* listed as the Commander of PVO SV with no VPVO affiliation indicated.[72] Thus, the PVO SV forces appear to have been returned to the Ground Forces while VPVO forces have been taken out of subordination to the military districts.[73] Furthermore, at least one, and probably both, of the IA schools transferred to the Soviet Air force have been resubordinated to the VPVO.[74] This in turn suggests that IA forces have been returned to VPVO control and is confirmed by the increased numbers currently attributed to the VPVO by the Defense Department.[75]

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71 Based on the author's survey of *Krasnaya zvezda* during the 1984-1986 period.

72 Chesnokov (1986). An earlier indication of Chesnokov's move is his signature on an obituary published in *Krasnaya zvezda* on May 5, 1986 which he signs with the Ground Forces officers rather than with the VPVO officers.

73 Department of Defense (1987; 58-9). This is also based on the scan of *Krasnaya zvezda*, indicating that military district affiliations are no longer attached to VPVO forces, although they are attached to PVO SV forces. (The branch or service affiliation of the force can usually be determined by descriptions of equipment or photographs.)

74 This is based on the publication of an article in *Vestnik PVO* by an officer identified as affiliated with the Daugavipils aviation school. See Shimanovskiy (1987).

75 Department of Defense (1987; 59).

While the new peacetime organization suggests a complete reversal of the 1981 reorganization, we know much less about the possible wartime structure. The general endorsement of the PVO Front system by various VPVO leaders leaves open the possibility that such a system might be established during wartime, although without its being subordinate to the TVD command. If this is the case then the new wartime structure would very closely resemble that of late 1944, although with greater authority given to the PVO Front commander.

In short, the reorganization of the VPVOS appears to have been largely reversed with only the name change remaining.

The VPVO's views on the reorganization and de-reorganization were expressed early in 1986 in a *Voyenno-istoricheskiy zhurnal* article by Colonel General I. M. Mal'tsev, Chief of the Main Staff of the VPVO. Mal'tsev's article treats both PVO SV and VPVOS organizational changes during the Great Patriotic War and comes to a conclusion opposite to that of Gorbunov and Frantsev: the delineation between VPVOS and PVO SV was a positive development, and their joint subordination to the Commander of Soviet Artillery was a negative development.[76] The difficulties with the beginning period of the war organization are noted and Mal'tsev specifically criticizes the fragmentation of forces under various commands, and argues for concentrating the control of PVO forces under one commander.[77] Mal'tsev also approves of the June 1942 centralization of the control of the PVO SV under the control of the Commander of Artillery, noting that

76 Mal'tsev (1986; 26-27, 31).
77 Mal'tsev (1985; 22-3).

this marked the culmination of the separation of the VPVOS and PVO SV, and then states that this solution to the problem of controlling the PVO forces was proven correct during the course of the war.[78] By so doing, Mal'tsev clearly implies that the separation of the two forces is a correct organizational structure during wartime.

Mal'tsev appears to be restrained in his enthusiasm for the PVO Front system. Describing the creation of the two front system he mentions the increase in flexibility and "operativeness" that resulted but then immediately criticizes the system for complicating control by creating two independent fronts, one of which was inactive. Furthermore, Mal'tsev explicitly states that he views the subordination of the VPVOS to the Commander of Artillery was a step backwards in the development of the organizational structure of the VPVOS.[79] His discussion of the further development of the PVO Front system is more neutral, but even his comments on the final four front system do not constitute a strong endorsement.[80] The overall tenor of Mal'tsev's comments, combined with his denunciation of the subordination constitute a strong criticism of the 1980-81 reorganization.

Ground force PVO organization receives less attention, but here again Mal'tsev notes deficiencies. Mal'tsev is particularly critical of the lack of corps level PVO control, arguing that centralized commands at the front and army level were unable to respond rapidly to the air situation. He notes that proposals for establishing such a control level were

78 Mal'tsev (1986; 24-5).
79 Mal'tsev (1986; 26).
80 Mal'tsev (1986; 27).

drawn up but were never enacted, so that the organizational structure of the PVO SV stayed unchanged until the end of the war.[81]

In his closing arguments, Mal'tsev notes that during the war a number of measures were taken to improve the organizational structure, first among these being the separation of PVO SV and VPVOS forces. The other measures that Mal'tsev singles out are the creation of operational-strategic (front) and operational VPVOS formations (*ob'yedineniy*), and formation of separate IA and AAA forces as branches of the VPVO. Finally, he points out that VPVOS had strategic tasks to perform and thus reported to the highest command authorities, while the PVO SV was responsible to combined arms commanders, with an independent system of control. To make sure that the surrogate argument is clear, Mal'tsev includes the statement that the creative use of the Great Patriotic War experience can solve contemporary problems of PVO control.[82] Mal'tsev thus makes his point quite forcefully and directly: PVO SV should be under the combined arms commanders, while the VPVO should report to the highest command levels as an independent service with centralized control of all VPVO forces. The argument directly criticizes the 1980-81 reorganization, particularly the subordination of VPVO assets to Military District and TVD level commanders.

Mal'tsev's article is both a justification of the de-reorganization and an argument for it. It is interesting to note that this article is more detailed and clear in its surrogate arguments than those published

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81 Mal'tsev (1986; 27). This criticism is very similar to that made by Lavrent'yev (1980; 76), see Chapter 6.

82 Mal'tsev (1986; 31).

before the decision. Clearly the earlier authors had to be more circumspect in putting their views across before they became accepted policy. Furthermore, unlike the arguments for the 1981 reorganization, this article is written by a high-ranking officer which implies that it had the VPVO's seal of approval.

Thus, there is evidence of strong VPVO opposition to the 1981 reorganization and a strong endorsement of the later reversal of the reorganization. How did the decisionmaking process work in this case?

8.6 Summary: Decisionmaking and the Reorganization

The VPVO's opposition to the 1980-81 reorganization was based on strongly held beliefs and principles concerning the effective organization of PVO. Chief amongst these is the emphasis on centralized, single control of VPVO forces by the VPVO leadership. The importance of this principle is reflected throughout the VPVO historical literature and during the 1980s it was reemphasized in arguing against the decentralization produced by the reorganization. The KAL incident appears to have triggered a reexamination of the problem and an increase in opposition.

The main target of VPVO dissatisfaction was the devolution of command and control of VPVO forces to the military districts. This violated the principle of centralized, single control and was consistently criticized through allusions to the deficiencies of the PVO organization at the beginning of the Great Patriotic War.

The second aspect of the reorganization was the transfer of PVO SV forces to the VPVO. While this transfer increased the forces available to the VPVO it also added responsibilities without a corresponding increase

in authority. Thus, while the PVO SV was added to the VPVO force structure it appears to have retained substantial autonomy and probably did not fall within the operational jurisdiction of the former VPVOS top leadership. Furthermore, the addition of these forces may have diluted the VPVO's main mission definition and complicated problems of resource allocation.

The addition of the PVO SV forces appears to have been insufficient to compensate for the loss of core forces such as half the IA fleet. These forces were directly concerned with the VPVO's main mission, homeland defense, and were not commensurate with the added PVO SV forces. This reduction in capability took place without a corresponding reduction in responsibility. Thus, the VPVO was placed in the difficult position of having to do more with less.

Finally, in addition to violating the principle of centralization, the new organizational structure seems to have complicated the transition from peacetime to wartime control. This issue was emphasized in the VPVO's concern over surprise attack and the need to react immediately to any air threat.

But given all these reasons for VPVO opposition to the reorganization, what could have prompted the reversal of the reorganization? What could have produced such a change in outlook on the part of the General Staff and State Defense Committee to induce them to reverse their decision?

First, VPVO objections appear to increase after the KAL incident, suggesting that the case might have provided additional ammunition in the campaign against the reorganization. While VPVO opposition had never com-

pletely disappeared, it took this incident to place the problem of organizational structure back on a prominent place on the agenda. The VPVO also did not lose any time in pressing the issue, as the Koldunov article arguing for changes in organization appeared only a few months after the KAL incident.

Second, two important personnel changes took place as Brezhnev died and in September 1984 Marshal Ogarkov was transferred to head the Western TVD and was replaced by Marshal Akhromeyev. An issue of such major importance as the reorganization of a service would have had to be approved at the highest level, so these changes may have been critical. Ogarkov's departure removed the architect of the TVD command system and its most ardent advocate. While Akhromeyev's position on TVD commands is not known it might have been easier to convince him of the VPVO's point of view since he was not directly responsible for the earlier decision and implementation. The replacement of two of the key players in the original decision may well have eased the path to the reconsideration and reversal of the reorganization.

Third, the development of the U.S. threat may have influenced the decision, although the direction of the influence is difficult to determine. From the Soviet perspective the U.S. threat had increased and become more imminent during late 1983 as the first ground-launched cruise missiles were deployed in Europe and the intermediate nuclear forces (INF) talks were broken off. At the same time the deployment of air-launched cruise missile equipped bombers had begun, presenting a qualitatively new threat for the VPVO.[83] The new weapons, coupled with a greater U.S.

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83 Cochran, Arkin and Hoenig (1984; 175).

stress on nuclear weapons in general, may have caused a shift in emphasis within the VPVO back to homeland defense from theater missions. While there is no clear evidence of this shift in the VPVO literature, it would be consistent with the new emphasis on centralized control of forces. On balance, though the increased U.S. threat may have catalyzed the decision to reconsider organizational structure it does not appear to provide a strong argument against the 1981 reorganization.

The confluence of all these factors seems to have strengthened the VPVO's hand and allowed it to win the debate, in contrast to 1981. This result is highly significant, for it implies that in some cases service advocacy may be able to win out over the General Staff position. While such cases may be rare, they do indicate some limits on the power of the General Staff and suggest that persistence by the services may eventually produce a reversal of unfavorable decisions. Thus, if in the normal case the General Staff may be able to dominate most debates the service position at least has the possibility of carrying the argument. If the General Staff completely dominated the decisionmaking process such an outcome would be highly unlikely.

At the same time, this case indicates that personalities may play an important role in the decisionmaking process: a reversal of the reorganization so soon after its enactment would appear to be much less likely with a strong proponent of the TVD organization like Ogarkov as the Chief of the General Staff.[84]

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84 Ogarkov was also a very forceful and persuasive character, whereas Akhromeyev appears to have much less personal and political influence.

Thus the interaction between levels 2 and 3 is not entirely one-way. The services do have some room to argue their cases, even though after a decision is made the arguments must be posed in a rather muted fashion.

CHAPTER 9

CONCLUSIONS

9.1 Overview: VPVO--General Staff Interaction

In the previous chapters the evolution of the VPVO has been examined with particular attention to issues of operational art and the role of the VPVO in Soviet strategy. At several points during the past 40 years the VPVO has undergone major changes in role, funding, or organization and these changes provide opportunities for examining the interaction of the VPVO with the other levels of the Soviet defense decisionmaking. What conclusions can be drawn regarding this interaction?

First, the crucial interaction is between the General Staff and the VPVO. The General Staff constrains the organizational behavior of the VPVO and imposes a unitary strategic actor viewpoint on the service. This conclusion is clear from the cases of PRO and the 1981 reorganization.

The decisionmaking stages in the PRO case seem to have a "bubble up" character, as service programs expanded to become matters of doctrinal importance. The agenda was set at the lower levels of the decisionmaking structure as the VPVOS forged ahead with its PRO development and deployment programs, and the issue rose upwards in the structure due to the unique nature of the weapons involved. The PRO system transcended the VPVOS's realm of operational art and took on a strategic and doctrinal significance that required the decision to be made at the Politburo level. The General Staff role in the PRO case was to some extent superseded by

the political dimension, for the issue had doctrinal significance that required settlement at the highest level. Nevertheless the position of the General Staff provided an important military argument against the continued PRO deployment that in turn influenced the argument amongst the political leaders, for had the military presented a strongly unified position in favor of PRO development it would have been more difficult for a political leader to advance an anti-PRO position.[1] We may conclude, therefore, that both the General Staff and the VPVOS attempted to exert decision influence but that actual decision authority clearly rested with the Politburo, and the actual decision may have been determined more by political considerations than the nuances of the two sides's arguments.[2]

In the case of the 1981 reorganization the role of the General Staff in determining strategy and strategic-level force organization is clear. The General Staff succeeded in completely restructuring Soviet air and PVO forces in the theaters, in an effort to increase their conventional warfare capabilities. While this change was opposed by the VPVO it was nonetheless pushed through. In this case while the VPVO attempted to influence the decision, the decision authority rested with the Defense Council although the plan itself and the initiative behind it would have come from the General Staff. But while the General Staff was able to push through the decision, the VPVO did not cease its opposition to the plan.

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1 This is due to both the limited expertise available to formulate such a position, and the sheer political difficulty of maintaining a position that is condemned by the specialists in the field. This is not to suggest that the military has veto powers in this area, but the use of military-technical arguments can play an important role in influencing leadership debates. See Meyer (1985; 39; 44-47).

2 The distinction between decision influence and decision authority is drawn in Meyer (1985; 39-40).

Furthermore, if the intent of the plan was to merge the VPVO and the PVO SV there are indications that it did not succeed in the implementation phase. The distinction between the two forces remained clearly drawn, particularly in the historical literature, and the surrogate arguments indicated that they retained different perspectives on organization and missions. Furthermore, the KAL incident seems to have provided evidence that the new command and control system did not perform well, and provided the opportunity for renewed efforts to influence and reverse the decision.

If the PRO and 1981 reorganization cases indicate the extent of the General Staff's authority and influence, then the 1986 reorganization provides some insights into the VPVO's role in the decisionmaking process. In this case service-level advocacy succeeded in undoing the earlier General Staff decision after a fairly short period of time. While the KAL incident may have acted as a catalyst for the change, it appears that other factors such as personnel changes also played a role. What is most interesting about the case, however, is that the VPVO appeared to put the issue on the agenda and bring about a favorable decision. This suggests that in some circumstances the services may be able to exert a significant level of influence and even bring about the reversal of previous General Staff decisions under favorable conditions. However, this does not mean that the services and the General Staff are equally powerful. Instead, it indicates that they are comparable actors and that the services may in a minority of cases achieve favorable decisions.

The case of the creation of the VPVO seems to be primarily a matter of level 1 (Politburo) and level 3 interaction, as the existence of a strong proponent of defense in a powerful position (Khrushchev) appears to

have had a very significant impact on the formation and development of the VPVOS. From this case we can derive little information about service and General Staff interaction, but we do see a form of influence on the Politburo based on the inflated estimates of effectiveness produced by the VPVOS. In this case these estimates appear to have had important strategic and even doctrinal implications for they formed an important basis for the decision to create a nationwide air defense system. Thus, by presenting military-technical arguments the service was able to influence higher-level issues.

Finally, in the transition from a nuclear-oriented homeland strategy to a more conventional orientation the VPVO and General Staff appear to have reached a consensus on the new VPVO roles and missions. This agreement was grounded in the needs of Soviet strategy (as determined by the General Staff), the capabilities of the VPVOS, and the historical experience and traditions of the Great Patriotic War. Thus, there does not appear to have been any conflict over this decision, and it seems to have passed through the decisionmaking structure at both levels 2 and 3 with the VPVOS carrying out the implementation. The implementation, however, may not have been highly successful for it required changes in operational art and tactics that the VPVO was slow in implementing. This slow implementation, though may be less due to organizational resistance than to the difficulties of organizational learning and conservatism outlined in a following section.

In examining the external behavior of the VPVO, then, we may place some bounds on the influence of the service. In the cases examined the VPVO appears to have attempted to influence decisions having both

strategic and doctrinal importance, but with relatively limited success. In comparison to the General Staff the VPVO appears to have significantly less influence, although not so much less that it cannot hope to win the debates. But the General Staff also has limitations on its power and influence, and these are similar to those of other directive organs in Soviet society. While their power may be quite great, actual execution of their decisions may be impeded and thwarted by the lower levels responsible for implementation. It is in this area, operational art, that the decisionmaking process appears to be quite different.

These issues of relative power and domains of responsibility are not abstract issues for they are directly related to Western interpretations of Soviet forces and intentions. To take one current example, how should the Soviet construction of the Krasnoyarsk radar be interpreted? Is it a result of bureaucratic bungling on the part of the VPVO, placed there because the terrain was suitable and the engineers were unaware of the ABM Treaty?[3] Or was it cleared and approved by the military and political leadership despite the fact that it represents a potential violation of the ABM Treaty?

First, the Krasnoyarsk radar does fall within the domain of VPVO responsibility and such a project would undoubtedly have been reviewed by the VPVO top leadership. Second, for such an important system the deployment would be formally reviewed by the General Staff. The approval process would have revealed the potential treaty violation, and elevated the issue to an even higher level for decision--the Politburo or the Defense

3 This, surprisingly, was the argument advanced by the Soviets in informal discussions with the U.S. congressional team that visited the site. See Downey, Carr, and Moody (1987; 12).

Council particularly since the General Staff would be reluctant to take responsibility for such a risky deployment. Third, the Minister of the Radioelectronics Industry during the time the decision to build the Krasnoyarsk was made had been a senior delegate to the SALT negotiations that resulted in the treaty.[4] It is almost inconceivable that the Minister was not aware of both the location of the radar and of the fact that it represented a potential violation of the treaty, since the issue would certainly have come up during both Ministerial and Military-Industrial Commission reviews. For such a decision to slip by unnoticed would require gross incompetence and negligence on the part of the VPVO, General Staff and the Radioelectronics Ministry. There is no evidence of such massive incompetence, and there were no apparent recriminations against the VPVO when the U.S. started complaining about the radar.

Thus there are very good reasons to believe that the VPVO leadership, the General Staff and the Defense Council were involved in the decision to approve the radar. Given the tendency to elevate problems to the highest possible level for decision it is almost certain that the decision to site the radar would have been made by the Defense Council and hence approved by the political leadership. In this case, then, the limits of a purely organizational approach to the study of Soviet defense decisionmaking are clear, and the application of a more detailed model of interaction between the services suggests a rather different decisionmaking process and intent.

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4 The minister in question is Aleksandr N. Shchukin. I am indebted to Peter Almquist for pointing out this fact.

9.2 Operational Art and Internal Behavior

The other major area of concern is the internal behavior of the VPVO and to what extent it may be explained by the organizational politics model.

Many of the propositions of the organizational politics model have been borne out in the case study, but the limitations of these propositions and the model must also be recognized. The organizational politics model acts as a supplement to the unitary strategic actor represented by the General Staff, and it applies primarily to issues falling within the domain of responsibility of the service, such as operational art. This provides considerable opportunity for organizational influences to manifest themselves in forces and operational art. While this domain of responsibility is much smaller than that of the U.S. services, it is non-negligible and has a definite impact on force structure and combat effectiveness.

Within the service the effects of organizational behavior tend to dampen innovation, foster inflation of performance, and hinder learning from combat experience. Let us examine the impact of organizational factors on the internal behavior of the VPVO following the categories proposed in Chapter 2.

9.2.1 Decisionmaking

The organizational politics model of organizational behavior suggests that decisionmaking within the organization will reflect conservatism and incrementalism. In the case of the VPVO these traits are observed in the area of operational art, weapons development, and tactics.

There is a good deal of evidence indicating that the VPVO engaged in incremental innovation, or even no innovation, in the area of operational art. The basic principles of operational art remained the same throughout the period under examination and are even invariant across nuclear and conventional threats. Despite the input from combat experience in local wars the rate of innovation seems very low in both operational art and tactics.

Did the VPVO develop standard operating procedures? The answer to this is a qualified yes. The principles of operational art form a set of standard operating procedures in that they provide simple guidelines that form the basis for decisionmaking. While such principles are part of any military service those of the VPVO are noteworthy for their lack of change over time and their application to a wide range of threats. Similarly, in the area of weapons development and tactics the VPVO and the design bureaus continued to apply their old standard operating procedures for designing aircraft, stressing ground-controlled intercept and missile attacks despite the growing importance of low altitude penetration and maneuvering air combat. Thus, in the broad sense standard operating procedures did figure in VPVO decisionmaking.

Weapons deployment also seems to have been distorted by a combination of inaccurate threat forecasting and organizational inertia.[5] Thus

5 The incrementalism in much of Soviet weapons design is a result of both technological limitations and of design practice and tradition. Incrementalism may over time produce very highly effective weapons, particularly if the basic concept was correct. Thus the MiG-21 (and the French Mirage) series aircraft despite their simplicity achieved very high performance in a number of areas critical to air combat. See Alexander (1978/9). As Stephen Meyer has also pointed out, sustained incremental change may also produce major changes over time. Furthermore, radical design changes may not always produce better products, as witness the F-111 and MiG-23 aircraft.

both the SA-5 and MiG-25 were deployed even after the threat they had been designed for did not materialize. Although they were assigned to other missions these missions were not as urgent as those for which they had been designed and probably would not have provided sufficient reason to design them in the first place. Thus, while the deployment of these weapons was not irrational bureaucratic inertia neither was it an optimal decision.

In the area of threat perception and inflation two competing dynamics seem to be at work. First, there is the conservative tendency not to interpret U.S. threats as an insuperable threat and to view them as evolutionary threats. Second, there is the tendency to worst-case analysis, to assign high effectiveness to enemy weapons systems. In the case of the cruise missile both of these tendencies seem to have been operative. The initial reaction was to view the cruise missile as a variation on an old threat, but as the scope and nature of the cruise missile program became clearer over time the threat perception shifted and became more of a worst-case analysis. At no time, however, did the VPVO admit that the cruise missile problem might be insuperable, it was always presented as a serious but manageable threat given the emerging new defensive technologies.

In the area of organizational change, it is clear that the 1981 reorganization was conducted on the initiative of the General Staff and that it was strongly opposed by the VPVOS. Conversely, the shift to a more conventional mission appears to have been precipitated by both the overall strategic shift towards conventional war and by the ABM treaty.

This shift served VPVO interests and coincided with those of the General Staff and appears to have been carried out successfully, although the VPVO did continue to retain a significant homeland defense role.

VPVO decisionmaking therefore seems to exhibit many of the characteristics we expect from an organizational politics model, particularly incrementalism and conservatism. In this case these tendencies may have been exacerbated by the long tenure in office of the VPVO leaders, as part of the stability of cadres policy. As in other areas of Soviet society this policy seems to have contributed to a general lack of innovation and efficiency in the VPVO.

9.2.2 Inter--Branch Behavior

From the material surveyed there is relatively little indication of inter-branch conflict. To some extent this may be due to the level of material surveyed--operational art rather than tactical. At the same time there are some interesting hints about the nature of inter-branch relations.

First, the problem of coordinating Fighter Aviation and AAA (and later SAM) forces was of great concern to the VPVO as shown in the historical literature. There are relatively few specifics on how to achieve coordination, an omission which could be due either to classification or the fact that these problems have not been worked out in detail.[6]

Second, the tactical literature of the branches tends to be quite separate--SAM forces are not discussed in the Fighter Aviation literature and vice versa. This compartmentalization in the literature may represent

6 On the one exception to this see Goncharov (1982).

a real split between the forces, which could lead to an ignorance of the performance and tactics of the other branches, thereby complicating interaction.

Third, there are indications that the level of autonomy of the Fighter Aviation forces during the Great Patriotic War was quite high, and this may have carried over to the present. This material is insufficient for a definite conclusion on the degree of coordination between the two forces, but there is reason to suspect that many problems still have not been fully worked out.

While a shift of emphasis away from SAM forces towards Fighter Aviation forces is visible in the late 1970s to early 1980s it is not clear that this represents a shift in the relative power balance between the branches. To some extent this may be a compensation for the missile-mania of the early 1960s, or it may be a recognition of the greater flexibility and maneuverability of Fighter Aviation forces. The latter is of great importance if the VPVO is to reinforce forces in the TVD and fill gaps, for only Fighter Aviation forces could be moved forward rapidly enough to fulfill the mission. Finally, the apparent emphasis on Fighter Aviation may have been due to a lull in the deployment of new SAM systems while a new generation (SA-10) was under development.[7]

9.2.3 Learning Behavior

VPVO learning from local wars appears to have been biased by preconceptions and poor data. The lessons of Vietnam and the Middle East were

7 This was certainly the case for the U.S., given the very long development of the Patriot SAM.

selectively interpreted in a manner consistent with prevailing VPVO beliefs and perceptions. Despite the abundant information showing the importance of dogfighting skills in air combat no major effort in this area was mounted until after the incontrovertible evidence provided by the Lebanon air war. Thus, biases and preconceptions have clearly hampered the learning behavior of the VPVO.

9.2.4 Overview of Internal Behavior

The VPVO clearly exhibits behavior similar to that predicted by organization theory, and this behavior may have a significant impact on the areas of operational art, tactics, and weapons development. Much of this behavior may result in inefficiencies and hamper the creation of an effective force, as threats are misinterpreted and lessons mislearned. But this does not mean that the VPVO is a completely moribund organization with fundamentally flawed perceptions of the threat. Indeed, Egyptian troops under VPVO tutelage demonstrated the effectiveness of dense air defenses in the 1973 war. But this demonstration does not mean that the VPVO would be able to achieve such results in a nuclear war, nor does it mean that the VPVO is operating as efficiently as it might be. There are still clear deficiencies in many areas of both equipment and troop performance that if remedied could increase the effectiveness of the force.

While there is evidence that the Soviet military leadership is aware of these problems and is now moving to try to eliminate them, the problems arise from the entire incentive structure of the organizations and are not likely to be easily alleviated. Even with a new leadership in place in the VPVO there is unlikely to be a rapid change in effectiveness.

9.3 Why the VPVO?

Having surveyed the application of theory and the history of the VPVO we are now in a position to return to the original question: why the VPVO?

The VPVO has gone through many changes and reorientations during the forty years since it was first incorporated as a service. At the same time the reasons behind the VPVO's support have shifted as new threats and new missions have arisen. Therefore, no one single answer can be given to the question "Why the VPVO?" Instead, we must treat the answer as one evolving over time.

The decision to create the VPVOS in 1948 is the least discussed and perhaps the most obvious of all the decisions in the VPVO history. Faced with a growing strategic bombing threat from the U.S. the decision to create a strong nationwide air defense system was a rational reaction. The fact that Stalin had a predisposition to strong air defenses may have colored this decision and influenced the priority given to it, but does not appear to have made it less rational. But the form of the system and the organizational structure were determined less by the threat than by historical precedent and the experience of the Great Patriotic War. In 1948 the VPVOS apparatus was already partly in existence, and its extension to service status was an easy and straightforward decision. As long as the VPVOS was only directed towards homeland defense the formation of a separate service would seem to minimize problems of interaction between Fighter Aviation and AAA forces. Even so, a lot of organizational tinker-

ing took place in the late 1940s and early 1950s before arriving at a satisfactory organization.

Similarly, the 1954 decision to upgrade the VPVOS to a full service status (by appointing a Commander in Chief--Deputy Minister of Defense) was largely in response to the growing U.S. threat, as was the greater priority being assigned the service even before the upgrading. While the decision was partly a result of political considerations and the struggle between Malenkov and Khrushchev, the growing emphasis on the VPVOS did have a clear logic given the expected effectiveness of new air defense technologies. This qualification is important--if the Soviet leadership had been given an accurate estimate of likely PVO effectiveness, say 10%, would the massive spending on strategic defenses have continued or would a more moderate "tripwire" system have been created? The answer to this counterfactual cannot be known, but it does appear that Khrushchev's bias in favor of missiles (SAMs) combined with technological optimism and organizational biases gave rise to a seriously distorted estimate of PVO effectiveness that contributed to the decision to create an extensive PVO system.[8] Estimates of PVO effectiveness were also an important consideration in weighing the balance between strategic offensive and defensive forces, for with a low effectiveness it might have been more cost-effective to stress offensive forces and counterforce missions.

By 1960 a new choice opportunity was emerging. The rapid development of U.S. ballistic missiles presented the VPVOS with a new challenge. Again, the top-level commitment to strategic defense, coupled with op-

8 These estimates of air defense effectiveness also appear to have been an important factor in deciding not to pursue a large-scale intercontinental bomber program.

timism concerning the rapid development of Soviet technology combined to produce an initial optimism concerning the prospects for missile defense. But with the installation of a new leadership with different priorities and biases, new data on SAM performance, and the influx of views and information from the Western ABM debate, the basic assumptions concerning PRO and strategic defense were reexamined. By this time the political and military consensus had shifted significantly, urging a return to a more conventional (and traditional) theater warfare orientation. These factors led to the final decision to engage in the SALT negotiations and the ABM treaty. They do not, however, explain the continued support of a strong air defense system.

The continued support for the VPVOS was a combination of military requirements, organizational conservatism and sunk costs, On the military side new missions were found for the existing arms and the VPVOS's basic mission was extended to support Soviet conventional operations by providing defense of rear areas and lines of communication for the advancing troops. At the same time the homeland defense mission was retained as a hedge against the U.S. bomber force and to prevent any possibility of a conventional bombing campaign in the event of a non-nuclear war. While the VPVO may not have been highly effective, its very existence caused "virtual attrition" against the U.S. bomber force and while this might not have been an adequate reason for creating such an air defense system from scratch, it was an acceptable rationale for its maintenance. While each of these reasons is in itself insufficient to justify the continuation of the PVO, taken together they provide a set of arguments that fit both

nuclear and conventional strategies while keeping open the option of an eventual return to a large-scale strategic defense mission.

But the redefinition of the roles and missions of the VPVOS also raised a number of new problems, such as interaction with the PVO SV, the Ground Forces, and the Air Force. These problems, combined with the growing stress on conventional warfare by the General Staff, led to the attempt to more closely integrate the VPVOS with theater forces. But the attempts to resolve the problem of interaction by reorganizing the VPVO clearly did not work. Instead of producing a clearer organizational structure the reorganization appears to have complicated and hampered the command and control of the homeland defense forces, rather than providing a clear and efficient control system.

In the 1980s the VPVO is again faced with a new threat in the form of cruise missiles and there are a range of options available. First, given the tremendous difficulty of detecting and destroying cruise missiles the Soviets could decide to forego active defense against them entirely, instead trying only to create a tripwire detection system that would warn of a cruise missile attack without attempting to inflict high attrition. Such a system would not be simple or cheap, but it would be much less expensive than the second option, a system designed to destroy a significant fraction of cruise missiles. A third option would be the creation of a force able to warn of, and destroy some fraction of, cruise missiles and a larger fraction of penetrating bombers. It appears that this third option has been chosen, and it is consistent with Soviet technological and economic limits, although it is unlikely to be very effective. The VPVO may face even more difficulties in the future, as new

technologies and weapons (cruise missiles, stealth technology) seem to be advancing the offense more rapidly than the defense and we may see a large drop in expected PVO effectiveness.[9]

For the future it appears likely that the VPVO will continue to follow a mixed scheme: conventional theater defense combined with a homeland defense system intended to provide detection and at least some moderate level of interception of cruise missiles. To do much more would require a significant and extremely expensive buildup of VPVO forces during a period of budget restrictions. Such a buildup appears highly unlikely. For the present the answer to the question, "why the VPVO?" is that it has taken on new missions that it can feasibly execute while retaining some of its old reasons for existence as well. A single answer misses the importance of its evolution over time and the role of conservatism and sunk costs.

9.4 Conclusion

The VPVO grew and evolved over time, and as it did so the reasons and rationales for its existence also changed to meet the needs of Soviet strategy and the capabilities of its forces. In examining modern force structure it is important to be aware of the historical and organizational factors at work, rather than to leap to rational-actor type conclusions from a cursory examination of modern forces. While the VPVO is not a vestigial organization, its continued existence does indicate the impor-

9 If one believes that they might score up to 10% now, then one could imagine a figure of less than half than that against cruise missiles and even less against stealthy cruise missiles or bombers. Even these figures seem far too optimistic in view of historical experience and the difficulties of operating in a nuclear environment.

tance of the interaction of strategic military analysis and organizational considerations.

APPENDIX A:

SAM PERFORMANCE IN VIETNAM

In early 1965 North Vietnam requested air defense aid from the Soviet Union, and in 1965 a Soviet-North Vietnam communique was released noting that the USSR would supply SAMs and other military equipment.[1] In July 1965, SA-2 missiles saw their first action over North Vietnam, on July 24th scoring their first kill against an F-4C.[2] Towards the end of the year SAM sites increased and by early 1966 an integrated PVO system had been established, with extensive supplying of SAMs continuing through early 1966.[3] When the U.S. Rolling Thunder bombing campaign resumed in February 1966, however, the effectiveness of the SAMs appears to have decreased due to "poor missile quality, inadequately trained missile crews, and the evasive tactics and effective electronic countermeasures (ECM) used by the USAF aircrews."[4] The U.S. also began systematically

1 O'Ballance (1981; 80).

2 Here the problem of wartime statistics raises its ugly head. The USAF version of this incident is that a SAM detonated in a tight formation of three aircraft, destroying one and damaging the other two. (See Air War--Vietnam (1978; 232-233).) The North Vietnamese claim that they destroyed all three aircraft with one missile. (See Hai Thu (1967; 26), also note that the date of the incident is listed as July 26).) In general, North Vietnamese estimates of U.S. losses appear to be inflated by a factor of two or three.

3 O'Ballance (1981; 90), Air War--Vietnam (1978; 236).

4 Air War--Vietnam (1978; 236-237).

attacking and suppressing the SAM sites under the "Iron Hand" program.[5] MiGs were also suppiled to North Vietnam, but their number was never great enough to create a major threat to U.S. air operations over the North, and their effectiveness was reduced by MiG sweeps and combat air patrols (CAPs).[6] U.S. accounts claim that by the end of October 1967 the advantage had turned to the U.S., with the success of defense suppression missions and the deployment of aircraft-mounted ECM pods.[7] In 1966, after the installation of the Soviet air defense system, U.S. losses over North Vietnam due to hostile action reached 280 aircraft while conducting approximately 80,000 sorties.[8] This gives an overall probability of kill per sortie of approximately 0.0035, or an attrition rate of 0.35%. While not all U.S. sorties encountered SAM fire or the densest air defense concentration, this effectiveness is fairly low, even when compared to World War II experience. More specific data on SAM launches and U.S. losses is given in Table A.1 below.

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5 Air War--Vietnam (1978; 239).

6 Air War--Vietnam (1978; 241-248), O'Ballance (1981; 103), Momyer (1978; 137-150).

7 Air War--Vietnam (1978; 240-241). Littauer's data suggests that attrition increased in 1967 but decreased in 1968, although the latter estimate is based on less reliable data. Littauer (1972; 274, 283). For a discussion of ECM, chaff, pod use and formations see Momyer (1978; 125-133).

8 Littauer (1972; 267, 274). Note that two sortie figures are given, I have used an approximation to the lower which gives a Pk more favorable to the SAMs. Littauer's book appears to be the most complete listing of statistics on the U.S. air war against North Vietnam. While sortie data for 1965 is available, loss rates are not disaggregated for that year. Also note that aircraft lost as a result of mechanical failure, pilot error or "operational causes" are not included in the data. Other tables in Littauer's book suggests that inclusion of these figures could raise the total losses by approximately 50%.

TABLE A.1: SA-2 Effectiveness[9]

Year	SA-2s Launched	U.S. losses	% Effectivenness
1965	194	11	5.7
1966	1096	31	2.8
1967	3202	56	1.75
1968*	322	3	0.9
1972	4244	49	1.15
Total	9058	150	1.66 (avg)

* Bombing in 1968 was only conducted for three months.

As the data show, SA-2 performance was markedly better than that of previous PVO means in terms of single-shot kill probability, but still did not live up to the very high claims made for it. Furthermore, the overall attrition rates for U.S. attacks against North Vietnam did not show a great increase over historical attrition rates. SAMs actually made a relatively small contribution to overall U.S. losses, as out of the approximately 500 aircraft downed over North Vietnam most were lost to AAA, with only approximately 46 downed by SAMs.[10]

North Vietnamese defenses were often effective in decreasing bombing accuracy, causing aircraft to jettison bombs in order to maneuver, and causing damage to aircraft, but they were not sufficient to force a cessation of the attacks.[11] Furthermore, U.S. aircraft were limited in their

9 This data may be found in both Momyer (1978; 136) and Isby (1981; 246-7). The 1972 figures may also reflect some SA-3 launches. Note that this does not include failed missile launches--missiles that never left the launch rails.

10 Littauer (1972; 44-45). Note that this total differs slightly from that cited by Isby. Given the "fog of war" however the agreement is quite good.

11 For a vivid description of the difficulty of penetrating North Vietnamese defenses see Broughton (1969). See also Momyer (1978; 136).

tactics and approach patterns by political considerations that made the deployment of air defense forces easier for the North Vietnamese.[12] In short, while the air defenses of North Vietnam were adequate against a conventional tactical attack the results would not be adequate when extrapolated to a strategic attack with nuclear weapons against the USSR, where effectivenesses of much greater than 2% would be required to blunt an attack.

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12 Broughton (1969; 63-65, 93-101), Momyer (1978; 133-135), Littauer (1972; 34-45).

APPENDIX B

THE 1978 KAL INCIDENT

On April 20, 1978 a Korean Airlines (KAL) Boeing 707 airliner on a polar-route flight from Paris to Seoul (via Alaska) flew far off course and penetrated Soviet airspace over the Kola peninsula. The Kola is one of the most sensitive and densely defended areas of the USSR as it is the home to the Northern Fleet. According to Seymour Hersh's detailed account based on Western intelligence sources, the VPVOS failed to intercept the airliner before it crossed the Soviet border, and then lost the aircraft over the Kola peninsula after Su-15 interceptors had been scrambled.[1]

When the interceptors did finally find the aircraft Soviet sources claim that the Su-15 pilots tried unsuccessfully to contact the flight crew and order the plane to land, while the flight crew contends that they were unable to make contact with the interceptors by radio and did not receive any instructions.[2] After several minutes the Su-15 fired two missiles at the aircraft, one of which hit, causing damage to the rear fuselage, killing two passengers and injuring thirteen.[3] Hersh, citing Western intelligence intercepts, claims that the Soviet pilot had clearly

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1 Hersh (1986; 3,7).

2 Hersh (1986; 3, 14). Suvorov (1982; 80-81) claims that there are no interceptors based on the Kola peninsula due to the poor weather, that all Kola PVO consists of SAMs, and that an Su-15 had to be flown in from Leningrad. This claim is preposterous, as there is substantial evidence of VPVOS IA bases, and Soviet Air Force bases, on the Kola. See, for example, Ries (1984; 877) who lists the VPVOS as having 120 interceptors on the Kola.

3 Paul (1978; 140-41), Hersh (1986; 6).

identified the aircraft as a 707 with civilian markings, but that he was directly ordered by a VPVOS general to fire on the plane despite this identification.[4] The damage to the cabin caused a depressurization and a temporary loss of control, but regaining control the pilot put the plane into a steep dive in order to reach an altitude where oxygen masks would not be required.[5] Leveling off at only 3000 feet the Korean flight crew realized that the interceptors were probably still searching for them and started a search for a landing site. For an hour and a half the aircraft flew over the Kola peninsula searching for a landing area, until a frozen lake was found where the pilot made a successful crash landing.[6] It took two hours for Soviet forces to locate the aircraft and dispatch helicopters to the scene of the landing, some 230 miles south of Murmansk. Later, arrangements were made for repatriating the passengers, and after their interrogation, the crew.[7]

This incident, coming only two weeks after the celebration of PVO Day, was a great embarrassment to the VPVOS. From the rather sketchy evidence it is clear that the VPVOS had some difficulty intercepting the airliner (flying at 39,000 feet in a straight line) and it is very likely that after the aircraft was damaged and flying at low altitude that it was lost again. In short, the VPVOS had proven only marginally effective against a very simple target, and once the target had become more difficult the VPVOS became ineffective. Clearly, the inability to locate

4 Hersh (1986; 12-14).

5 It's also possible that the pilot realized he had been fired upon and tried evasive action.

6 Paul (1978; 142-43).

7 Paul (1978; 143-144).

an airliner flying at 3000 feet without the benefit of jamming or defense suppression would not reflect well on the VPVOS's ability to intercept bombers (even less fighters) using electronic countermeasures, flying at lower altitudes, and equipped with nuclear missiles for defense suppression. Moreover, the "troops of constant combat readiness" were found wanting in their combat readiness as well. Given a surprise target they reacted slowly and ineffectively.

Soviet (and for that matter, Western) coverage of the incident was restrained. In *Krasnaya zvezda* coverage was limited to two small TASS communiques tucked away on page three. The first communique claimed that the KAL flight had ignored orders to land and had flown for two hours over the Kola before making a forced landing. No mention was made of VPVOS forces firing on the aircraft, leaving the impression that the aircraft just flew around with the interceptors in tow for two hours.[8] The second communique was a little more informative, stating that VPVOS "actions" caused the aircraft to land, and reporting that the flight crew had confessed its guilt for violating Soviet borders and not obeying orders to land.[9] These communiques were the only explicit comments on the incident to appear in the Soviet military press, in stark contrast to the reaction to the KAL incident (after a few days of denial), and the Rust incident.[10]

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8 *Krasnaya zvezda* April 22, 1978, p. 3.

9 *Krasnaya zvezda*, April 30, 1978, p. 3.

10 The most detailed and explicit discussion of the 1978 incident was published after the 1983 shootdown by Col. Gen. Yurasov. Yurasov argues that the two flights had many similarities, that the 1978 flight crew knew where they were at all times, that the flight was synchronized with U.S. Ferret electronic intelligence satellite overflights, and that a Western reconnaisance aircraft was in the region at the time. These charges are clearly intended to bolster the similar charges leveled against the KAL 007 flight but they may in fact reflect real VPVOS views on the nature of both of these flights. See Yurasov (1983; 3).

In addition, there is no evidence of a major campaign in *Krasnaya zvezda* to eliminate the problems encountered by the VPVOS forces.[11] There do appear to have been repercussions for the top leadership, however.

The most obvious result was the replacement of Batitskiy by the First Deputy Commander A. I. Koldunov in July 1978.[12] On this matter there is some uncertainty, though, as there was a long delay before Batitskiy was replaced. Furthermore, as Jones points out, Batitskiy had missed at least one important meeting before the KAL incident, and several afterwards indicating he may have been battling an illness.[13] Thus, there is no direct, explicit connection between the incident and Batitskiy's departure but given the relatively poor performance of the VPVOS it may have been an important factor in deciding to replace Batitskiy. It is possible that a decision was made to wait a decent interval before replacing Batitskiy.

Batitskiy's replacement was certainly not an outsider. Koldunov was a VPVOS career officer with a background in aviation. During the Great Patriotic War he was a fighter ace with 46 kills to his credit, and after

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11 There are critical articles concerning Radiotechnical Troops performance in *Krasnaya zvezda* in the period following the KAL incident, but these are not particularly unusual and are not clearly tied to the KAL incident. Again, the case is quite different in the Rust incident which triggered a series of very critical articles in *Krasnaya zvezda*. As noted below, there does appear to have been a new campaign launched in *Vestnik PVO*, although it is not harshly critical of the VPVOS.

12 Batitskiy's last appearance as Commander in Chief is reported in *Krasnaya zvezda* July 2, 1978, p. 2. Koldunov signs an obituary as Commander in Chief in *Krasnaya zvezda*, July 26, 1978 p. 4.

13 On the missed PVO day ceremony see *Krasnaya zvezda* April 8, 1978 p. 1. For the list of post-KAL absences see Jones (1979; 26). I have confirmed this list through a scan of *Krasnaya zvezda* articles from January through August 1978.

the war he commanded an IA regiment, then was a deputy commander, commander of IA of a PVO district, followed by deputy, then commander of the entire district. Koldunov's biography also lists the command of an *ob'yedineniy* (army or front), but no details are given. From November 1970 Koldunov was commander of the Moscow PVO district and in 1975 was promoted to First Deputy Commander in Chief.[14]

Koldunov changed some top personnel in the VPVOS, but there does not appear to have been a "purge."[15] Colonel General V. D. Sozinov, the long-time head of the VPVOS Main Staff was promoted to the position of First Deputy Chief, as was Col. Gen. Ye. S. Yurasov.[16] The other First Deputy Chief under Batitskiy, Colonel General I.D. Podgornyy, may have been removed.[17] Neither of these officers was imported from the outside,

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14 Akhromeyev (1986; 339).

15 Jones (1979; 25-27) claims that there was rapid turnover in the leadership, giving an "impression of turmoil." This judgement appears to have been a bit premature, however, as it was based on identifications from obituaries which do not appear to have been borne out. Instead the promotions appear to have been from within and most incumbents were retained in their posts.

16 Yurasov's previous position is unknown. His promotion to FDC seems to have been a big jump. Yurasov did sign some VPVOS obituaries during the 1970s in a position indicating some responsibility for the SAM troops, possibly Chief of Staff of the SAM troops. One source, however, suggests that he was an electronics and communications specialist. See "Gen Tretyak Reorganises Air Defense," (1988; 278-279.

17 CIA (1980; 19), CIA (1978b; 19). Podgornyy's role is rather uncertain. Judging from his articles in *Vestnik PVO*, Podgornyy had special responsibility for interaction with Warsaw Pact PVO forces, see Podgornyy (1970), (1972), (1976), (1981). Podgornyy disappears from VPVOS obituaries after approximately 1976, but he published an article in 1981 in *Vestnik PVO* on a Warsaw Pact theme, suggesting that he was still associated with the PVO and the Warsaw Pact. Jones (1980; 153), (1981; 114), (1982; 140-141) lists Podgornyy as First Deputy Chief but does not list Sozinov as First Deputy Chief, even though the latter is listed in the 1980 CIA directory. As Jones notes, it is possible that Podgornyy was transferred to the Warsaw Pact staff to coordinate PVO forces, but he does not appear on the CIA lists of Warsaw Pact personnel. (Jones observes that the fact that Podgornyy is not identified in the 1981 article as First Deputy Chief suggests that he was not in that post. However, none of Podgornyy's articles ever listed his position, so the omission in this

but the new Chief of the Main Staff (who was probably brought in sometime in late 1979) was a former First Deputy Chief of Staff of the Warsaw Pact.[18] Finally, it should be noted that the position of Commander of IA Forces had changed hands in March (from Borovykh to Moskvitelev), and so Koldunov may not have seen any need to make further changes in this branch.[19]

The most puzzling personnel change was the appointment of Colonel General V. V. Druzhinin to the post of First Deputy Chief of the VPVOS Main Staff.[20] Druzhinin had been commander of the VPVOS Radiotechnical Troops in the late 1960s, and in 1970 was promoted to Deputy Chief of the General Staff for Armaments.[21] While in the General Staff he was responsible for the widespread development and introduction of computers and electronics, including automated systems of control, and published the definitive Soviet text on cybernetics in military affairs.[22] There are two possible explanations for Druzhinin's sudden change of jobs: a) that he was brought in by Koldunov to clean house after the KAL affair, or b)

(continued)

case does not mean much.) Podgornyy also appears in the 1983 CIA directory (1983; 9) listed as a First Deputy Chief. In the 1986 directory he is not listed, but in a 1985 obituary he appears to sign with the retirees and inspectors. On balance it does not appear that Podgornyy was replaced when Koldunov took over, and the two First Deputy Chief positions may have been increased to three at least temporarily. Sozinov may have left the VPVOS in 1980 or thereabouts.

18 Jones (1980; 153).

19 Jones (1979; 26).

20 Jones (1979; 26).

21 Scott and Scott (1984; 121).

22 Scott and Scott (1984; 121). The book mentioned is V. V. Druzhinin and D.S. Kontorov, *Ideya, algoritm, resheniye*, (Moscow: Voyenizdat, 1972), available in english as *Concept, Algorithm and Decision*, (Washington, D.C.: US GPO, 1978).

that the command and control systems developed by Druzhinin were found wanting in the KAL incident and he was consequently demoted. Neither of these explanations is particularly satisfactory. First, if Druzhinin were brought in to shake up the VPVOS, it is surprising that he would be placed in such a low-level position. One would expect him to be given an FDC or Deputy Chief position. Second, if there were serious problems with the work of the Main Staff, Sozinov should have been immediately replaced, which does not appear to have been the case. (Albeit the importing of Romanov may suggest some problems with the Main Staff.) However, concerning the second explanation there is little evidence that the VPVOS or other control systems did not function properly. Clearly there were problems, but the best evidence is that these were of a tactical or decision-making nature, rather than having to do with technical systems. Furthermore, if Druzhinin were disgraced the usual response would have been to either retire him or farm him out to the Main Inspectorate of the Ministry of Defense.

Druzhinin's appointment is thus quite a mystery. The best explanation may be a mixture of the two outlined above. Perhaps problems revealed with command and control systems reflected badly upon Druzhinin's work at the General Staff, but that instead of being retired he was given the opportunity to return to the VPVOS and try to correct the problems. This explanation, while less than satisfactory, seems plausible.

Koldunov thus made several high-level changes in the VPVOS, but almost all of his appointments were of VPVOS personnel (or alumni). The fresh blood, then, was not so fresh and there do not appear to have been any major policy changes as a result of this new administration.

Indeed, the VPVOS responded somewhat slowly to KAL incident, and when it did respond it was with a new campaign to improve combat readiness and to instill a "Leninist style of work." While there are some indications of editorial reaction during the preceding months,[23] the December 1978 issue of *Vestnik PVO* kicked off the campaign with a report from a meeting of the VPVOS Military Soviet.[24] Koldunov criticized some officers of the central apparatus for not living up to the demands of their job:

> The majority of officers do a good job, but, as shown by concrete facts and examples, the style of work of certain officers and generals still does not in complete measure answer the conditions of the XXV Congress and demands of the Ministry of Defense. Not all leading cadres scientifically work expediently, disciplinedly, qualitatively and effectively to solve growing complex tasks of preparation of troops to fulfill their combat tasks.[25]

The Chief of the VPVOS Military-Political Administration, Bobylev, then addressed the Military Soviet calling for greater attention to party work, greater responsibility, and communist ideals. Koldunov wrapped up the affair by calling again for higher combat readiness and noting that concrete measures were being taken to improve the performance of the officer corps and raise combat readiness.[26]

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23 See the August *Vestnik PVO* (1978a), "Za dal'neyesheye povbysheniye boyegotovnosti," for the Military Soviet meeting that introduced Koldunov and Yurasov to the VPVOS, "Vypolnaya konstitutsionnyy dolg" in the September issue.

24 The Military Soviet is composed of the top leadership of the service. See "Sovershenstvovat' stil' raboty ofitserkikh kadrov," (1978) in *Vestnik PVO* for December.

25 "Sovershenstvovat' stil' raboty ofitserkikh kadrov," (1978; 9).

26 "Sovershenstvovat' stil' raboty ofitserkikh kadrov," (1978; 9).

This new emphasis on combat readiness and officer performance was reflected in the articles in the December *Vestnik PVO*: Svetlishin contributed a historical article ("The Key to Victory") on the importance of combat readiness in the GPW, Colonel General Konstantinov the Commander of the Baku Air Defense Distict contributed an article on officer training, and Koldunov signed the editorial calling for increased combat readiness.[27]

Thus the KAL incident, while it seems to have precipitated a leadership change in the VPVOS, was taken in stride by the system. Instead of the vociferous and detailed criticisms triggered by the Rust affair, the reaction was muted and the proposed solution merely carried on the old campaigns, albeit with more energy.[28] The VPVOS's response was typical of that of many large conservative organizations: in the case of failure ascribe it to a specific set of people or circumstances rather than recognizing the systemic implications. A business-as-usual but under better management approach was adopted by the new leadership. Certainly, little consideration seems to have been given to the possible consequences of actually shooting down a civilian airliner, and rules of engagement do

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27 Svetlishin (1978b), Konstantinov (1978), Koldunov (1978). Note that Koldunov (1978; 7) notes the need to correct the deficiencies revealed in the last training year and specifically criticizes the work of three officers. This sort of call is fairly standard but the naming of the officers is somewhat unusual and may be directly tied to the KAL incident.

28 Articles calling for increased combat readiness, improved officer training and performance, and a Leninist style of work were already common in *Vestnik PVO* before the KAL incident. See, for example, Sozinov (1978), Batitskiy (1978a) on combat readiness, Koldunov (1978a) on the need for officer education and a Leninist style of work, Sosnovtsev (1978) on the need for discipline and following regulations, Trofimov (1978) on the attestation of officers, on combat readiness, and Kraskovskiy (1978) on officer staff competence.

not seem to have been amended to make such an incident less likely, as shown in the 1983 KAL disaster. Indeed, the only difference between the two cases is that in 1978 the missile damaged but did not cripple the aircraft. This inability to foresee the possibility of another accidental intrusion led directly to the KAL 007 shootdown.[29]

BOTH ID ?

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29 Curiously, few in the West in the civil aviation field reacted strongly to this incident. Had a system for establishing contact between Soviet interceptors and Western airliners been developed after the 1978 incident the 1983 shootdown might have been avoided.

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